Form PTO-1595
(Rev. 03/01)
OMB No. 0651-0027 (exp. 5/31/2002)

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Kirk SWINIMER

Additional name(s) of conveying party(ies) attached? [ ] Yes [x] No

2. Name and address of receiving party(ies)
Name: F & S Manufacturing Inc.
Internal Address:
Street Address:
6750 Hwy #3, R.R. #2
Mahone Bay
City: Nova Scotia
: CANADA Zip: BOJ 1J0
Additional name(s) & address(es) attached: [ ] Yes [x] No

3. Nature of Conveyance:
[ ] Assignment [ ] Merger
[ ] Security Agreement [ ] Change of Name
[X] Other Ownership Transfer Document
Execution Date: October 21, 2004

4. Application number(s) or patent number(s):
If this document is being filed together with a new application, the execution date of the new application is:
A. Patent Application No.(s):
B. Patent No.(s) 6,840,491 B2
Additional numbers attached? [ ] Yes [X] No

5. Name and address of party to whom correspondence concerning document should be mailed:
Name: James R. Crawford
Fulbright & Jaworski L.L.P.
Internal Docket No: BORDEN-206
Street Address:
666 Fifth Avenue
New York, N.Y. 10103

6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 3.41) $ FEE PAID
[ ] Enclosed
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To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

James R. Crawford — Name of Person Signing
James R Crawford — Signature
5/24/05 — Date

Total number of pages including cover sheet, attachments, and documents: 38

11-15-04

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11-24-2004

Form PTO-1595 (Rev. 10/02)
OMB No. 0651-0027 (exp. 5/31/2002)

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U.S. DEPARTMENT OF COMMERCE
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If this document is being filed together with a new application, the execution date of the new application is:

A. Patent Application No.(s):
10/316,814

B. Patent No.(s)

Additional numbers attached? [ ] Yes [X] No

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01 FC:8021 40.00 OP

6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 3.41) $ 40.00

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James R. Crawford — James R. Crawford — 11/15/04
Name of Person Signing — Signature — Date

Total number of pages including cover sheet, attachments, and documents: 36

DOMINION OF CANADA
PROVINCE OF NOVA SCOTIA
COUNTY OF LUNENBURG

STATUTORY DECLARATION

TO WIT:

I, G.F. Philip Romney, of Mader's Cove, in the County of Lunenburg and Province of Nova Scotia;

DO SOLEMNLY DECLARE:

1. THAT I was retained in the late Spring of 1996 to incorporate a company of which the shares were to be owned by Jackson W. Fickes and Kirk Swinimer.

2. THAT the company was eventually incorporated as F. & S. Manufacturing Inc. on July 26, 1996.

3. THAT Kirk Swinimer designed footing forms and had applied to patent same.

4. (a) THAT before F. & S. Manufacturing Inc. was incorporated, from mid June 1996 to July 26, 1996, I had a number of conferences with both Jackson W. Fickes and Kirk Swinimer concerning the proposed business of the company. The "Big Foot" design was discussed as well as possible manufacturers. In my file are notes in regards to the Investment Agreement indicating that patents were to be owned by the company and as a result, the Agreement was drafted accordingly. The file also contains some correspondence between Joachim T. Fritz and Kirk Swinimer and in particular a letter dated June 11, 1996 from Joachim T. Fritz to Kirk Swinimer which describes generally the "Big Foot" product. That it was and still is, my belief that all patents applicable to "Big Foot" products to be designed, manufactured and sold by the company were to be owned by the company.

   (b) THAT I have reviewed United States Patent Number: 5,785 459 and a document entitled "Footing Form", which are attached hereto as Schedules "A" and "B". Figures 1, 2, 3 and 6 in United States Patent Number: 5,785 459 and figures 1, 2, 3, 4 and 5 of the Footing Form document generally appear to represent which I believed was the product that the company intended to design, patent, manufacture and sell.

5. THAT attached hereto to this my Affidavit as Exhibit "C" is a copy of page 11 of the Agreement and in particular, I refer to paragraph 9 (b). The intent of that paragraph was that all patents applicable to "Big Foot Footing Designs" were to be owned by the Company and not an individual shareholder.

6. THAT on the 13th day of September, 2004, I faxed a letter to Kirk Swinimer, a copy of which is attached hereto to this my Affidavit as Exhibit "D".

7. THAT Kirk Swinimer has not replied to that letter to date.

AND I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

DECLARED before me at Bridgewater, in the County of Lunenburg, and Province of Nova Scotia, this 21st day of October, A.D., 2004,

LOIS D. SMITH
A Commissioner of the Supreme Court of Nova Scotia

G.F. PHILIP ROMNEY

US005785459A

United States Patent [19]

Swinimer

[11] Patent Number: 5,785,459

[45] Date of Patent: Jul. 28, 1998

[54] **PREFABRICATED FORM FOR MOLDING A FOOTING OF A SETTABLE STRUCTURAL MATERIAL**

[76] Inventor: **Kirk Swinimer**, R.R. #1, Chester Basin, Nova Scotia, Canada, B0J 1K0

[21] Appl. No.: **682,269**

[22] Filed: **Jul. 17, 1996**

[51] **Int. Cl.**[6] **E02D 5/66**

[52] **U.S. Cl.** **405/237**; 405/229; 52/296; 249/13

[58] **Field of Search** 405/231, 237, 405/244, 249, 256, 257, 238; 52/298, 296, 297, 100, 219; 249/11-13, 18, 19, 31, 32, 34, 48, 51, 117, 176, 143, 155

[56] **References Cited**

U.S. PATENT DOCUMENTS

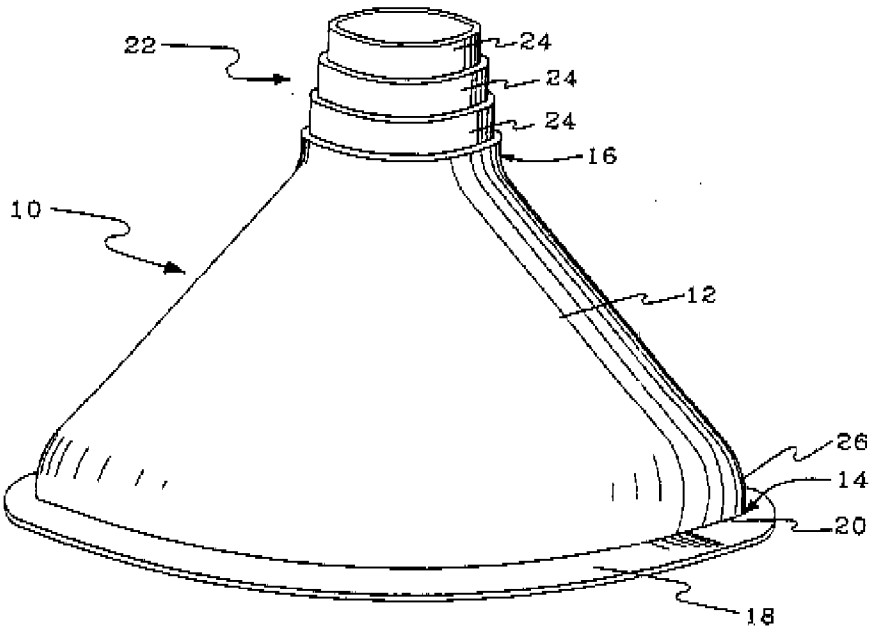
1,296,995	3/1919	Miller	405/238
3,108,403	10/1963	Jackson	52/297
3,159,899	12/1964	Pafenberg	25/118
3,159,900	12/1964	Pafenberg	25/118
4,648,220	3/1987	Gebelius	405/237 X
4,673,157	6/1987	Wells	405/257 X
4,830,543	5/1989	Joubert	249/13 X
5,271,203	12/1993	Nagle	52/298 X

Primary Examiner—Tamara L. Graysay
Assistant Examiner—Frederick L. Lagman
Attorney, Agent, or Firm—Pearne, Gordon, McCoy and Granger LLP

[57] **ABSTRACT**

A prefabricated form for molding a footing of a settable structural material at the bottom end of a tubular form for a structural pillar is disclosed. The form is preferably constructed from a thermoplastic such as a high density polyethylene or ABS and is molded as a single disposable unit. The form is bell-shaped and has a sidewall which is inclined at an angle of about 45° to about 65° with respect to the bottom edge. A top flange of the form is preferably adapted to accommodate two or more different diameters of the tubular form for the structural pillar. The sidewall may include integral ribs which open inwardly to facilitate evacuation of air as the form is filled and to lend rigidity to the sidewall to ensure that it will not collapse if earth is backfilled around the form before the form is filled with settable material. The advantage is an inexpensive form which fills reliably without the entrapment of air pockets, supports a tubular form for a pillar without cross-pieces, may be left in the ground and actually protects the footing from the intrusion of water, etc. Thus significant savings in labor and a significant improvement in the quality of footings for structural pillars made using tubular forms is realized.

16 Claims, 5 Drawing Sheets



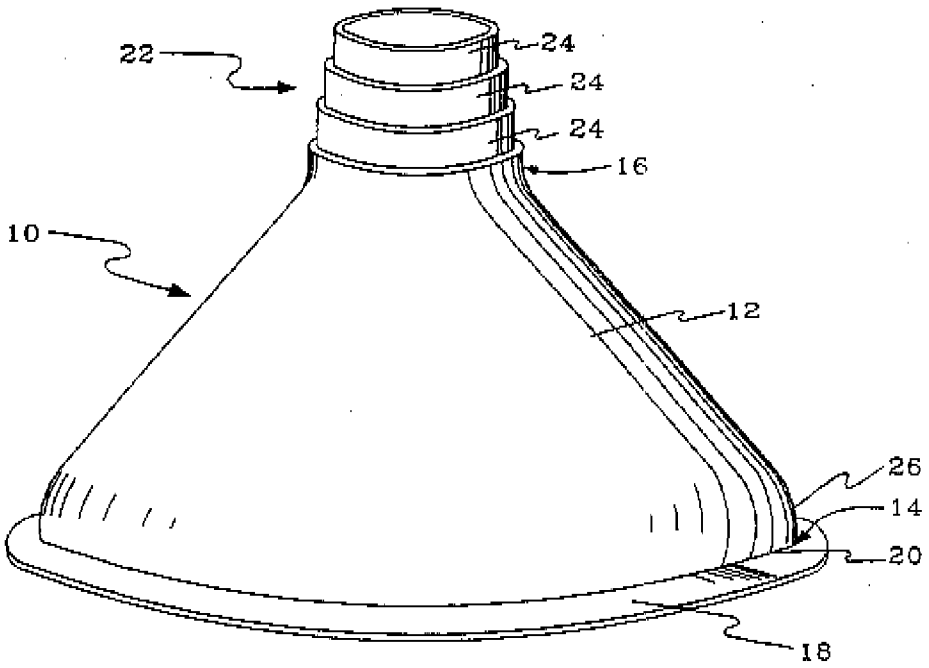


FIG 1

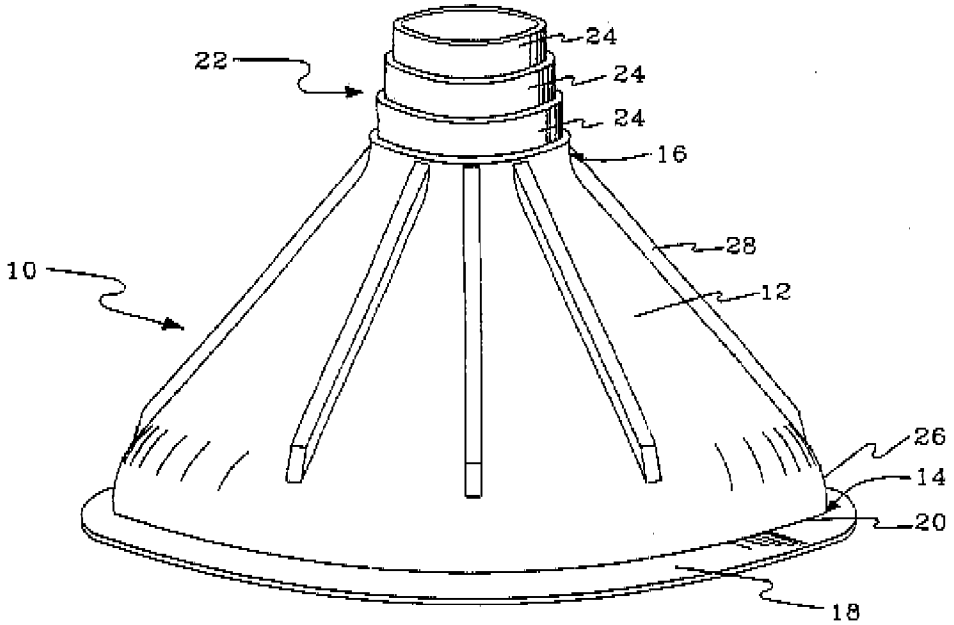


FIG 2

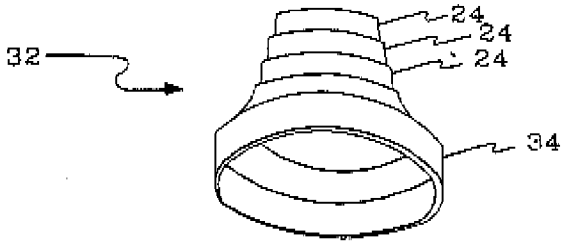


FIG 5

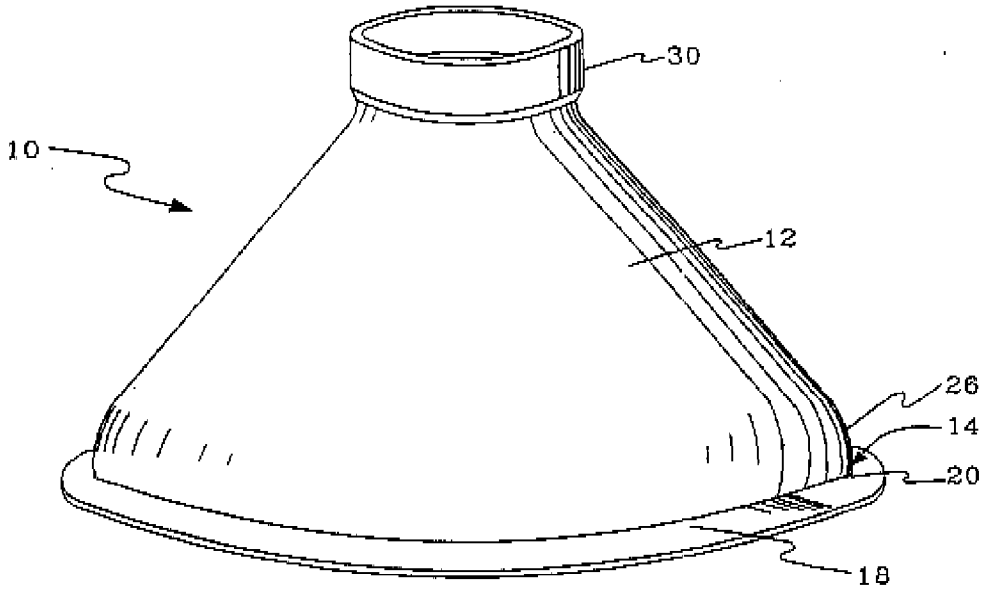


FIG 3

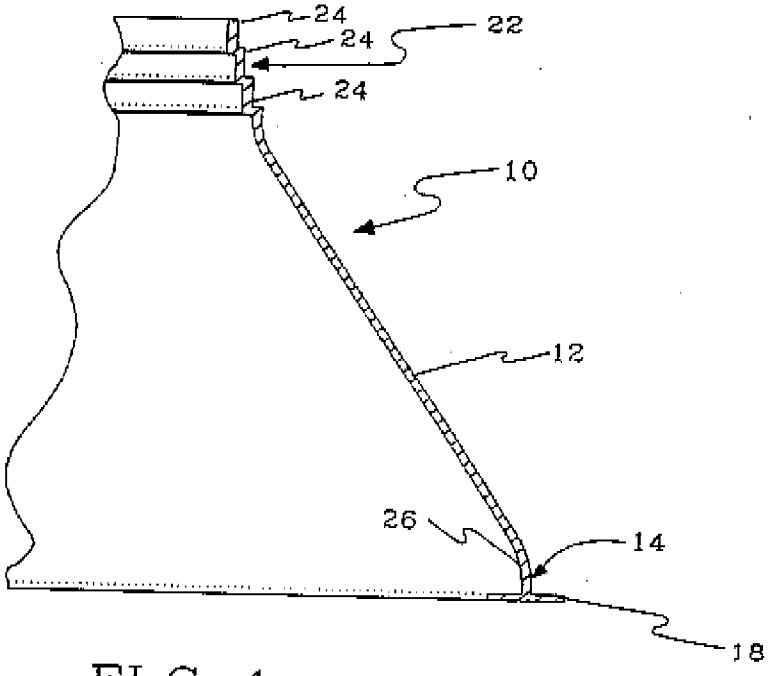


FIG 4

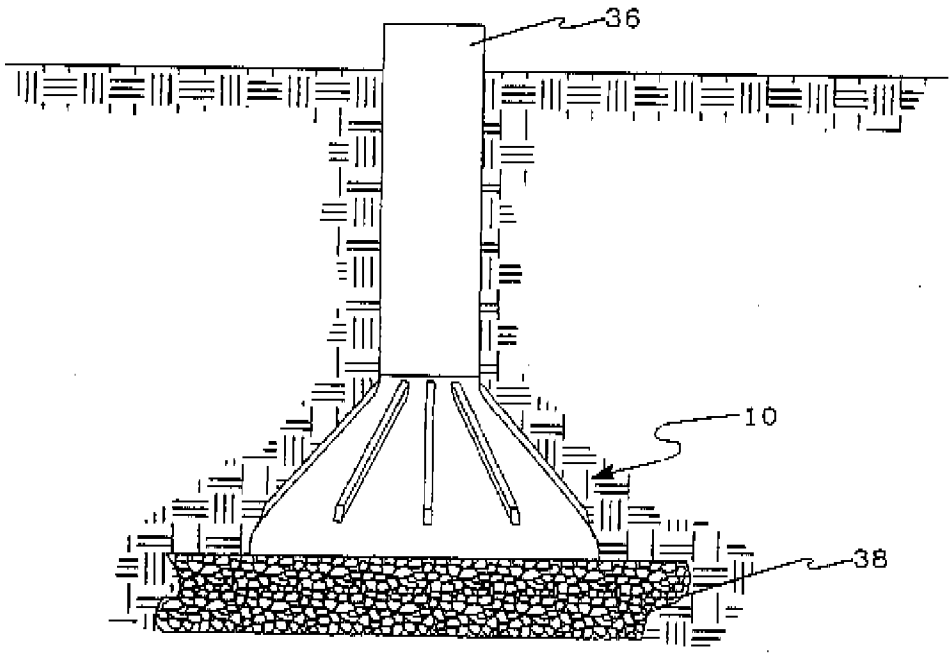


FIG 6

PREFABRICATED FORM FOR MOLDING A FOOTING OF A SETTABLE STRUCTURAL MATERIAL

FIELD OF THE INVENTION

This invention relates to forms for molding settable materials such as concrete, polymer concrete or the like and, in particular, to forms for molding footings for structural pillars used in the construction industry.

BACKGROUND OF THE INVENTION

The use of structural pillars in the construction industry is well known and widely practiced. Such pillars are constructed using a settable material such as concrete which is typically poured into a tubular form. Tubular forms made of spirally wrapped paper are well known and commonly used for this purpose. Structural pillars are usually set on a coarse aggregate bed to ensure good drainage. The aggregate bed is normally laid in a trench dug below the level of maximum frost penetration to minimize movement due to frost heaving. A footing for each pillar is required between the aggregate bed and the pillar to distribute weight and provide adequate support for the pillar and its load. Traditionally, the forms for this footing have been built in situ using plywood or wooden planks which are cut to form a rectangular frame that is nailed together and set on the aggregate bed. The rectangular frame generally includes at least one cross-piece for supporting the tubular form for the pillar. There are several disadvantages to this practice. First, the cutting and nailing together of materials for the form for the footing is labour intensive and time consuming. Second, such forms do not generally fill properly when concrete is fed through the top of the tubular form. Usually, at least the corners of the form are not properly filled. In addition, air pockets often form around the cross-piece for supporting the tubular form, and the cross-piece itself must be left in the concrete after it is set and the form is removed. All of these factors contribute to an inferior footing which is subject to the intrusion of water that may damage and weaken the footing. Besides, unless the top of the footing form is closed, earth cannot be backfilled around the form before the concrete is poured. This often contributes to inconvenience and unfavourable working conditions. Besides, even if the top of the footing form is closed, most building codes require that any forming material made of wood be removed before backfilling. This is because buried wood holds moisture, which can cause frost damage.

There therefore exists a pressing need for a simple, inexpensive prefabricated form which eliminates these disadvantages.

Prefabricated molds for concrete are known and taught, for instance, in U.S. Pat. Nos. 3,159,899 and 3,159,900 which issued respectively on Dec. 8, 1964 to Pafenberg. Each of these patents teach a mold for attaching anchor weights to the legs of children's yard swing sets. The mold is incorporated permanently in the anchor weight and provides a decorative outer covering for the anchor weight. While the molds taught by Pafenberg are well suited for their intended purpose, they are not adapted for use as a form for a footing for use in conjunction with tubular forms for pillars.

SUMMARY OF THE INVENTION

It is an object of the invention to provide an inexpensive prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar.

It is another object of the present invention to provide a prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar, which is shaped to ensure that the form is completely filled without entrapped air pockets when the settable material is poured through a top end of the tubular form attached thereto.

It is yet a further object of the invention to provide a prefabricated form for forming a footing of a settable structural material at a bottom end of a tubular form for a structural pillar which is adapted to accommodate a plurality of diameters of tubular forms for pillars.

In accordance with a preferred embodiment of the invention, there is provided a prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar, comprising:

a substantially frusto-conically shaped hollow body having a circular top end and a circular bottom end spaced below and concentric with the top end, and an integral sidewall that extends between the top end and the bottom end, the sidewall being inclined at an angle in a range of about 45° to about 65° with respect to a plane of a bottom edge of the bottom end;

a bottom flange that extends radially from the bottom edge of the bottom end;

a top flange that extends axially from the top end, the top flange being adapted for the connection of at least one diameter of the tubular form, whereby the prefabricated form is positioned on a suitable substrate in a location where a structural column is required, a tubular form is frictionally engaged with the top flange and both forms are filled with the settable material from a top end of the tubular form to construct the structural column either before or after earth is backfilled around the forms.

The invention therefore provides a prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a pillar. The form is preferably molded from a thermoplastic resin such as high density polyethylene or ABS, although any other rigid, water resistant material with adequate strength is also suitable. The form is molded as a unit and is bell-shaped in profile. It includes a bottom end with a radial flange and a top end having a top flange that is sized to frictionally engage a tubular form of a specific diameter. The flange on the top end may be adapted to engage the tubular form either internally or externally, but preferably it is adapted to engage the form externally and it is preferably adapted to the connection of a plurality of different diameters of the tubular form.

Furthermore, in accordance with the preferred embodiment of the invention there is also provided an adapter which permits the connection of one or more tubular forms of a smaller diameter to the prefabricated footing form. This increases the versatility of the prefabricated form. Alternatively, the prefabricated footing form can be manufactured in a range of sizes so that a single form is not universally adapted to accommodate a wide range of diameters of tubular forms for a pillar.

A principal advantage of the prefabricated footing form is that it can be left in the ground, so backfilling can take place before concrete is poured, obviating the hazard of open trenches. Furthermore, the form actually protects a footing which it covers from the intrusion of moisture and other potentially damaging substances, therefore prolonging the life of a footing that it encases.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described by way of example only and with reference to the following drawings, wherein:

FIG. 1 is a perspective view of a first embodiment of the prefabricated form in accordance with the invention;

FIG. 2 is a perspective view of another embodiment of the prefabricated form in accordance with the invention;

FIG. 3 is a perspective view of yet another embodiment of the prefabricated form in accordance with the invention;

FIG. 4 is a partial cross-sectional view of the embodiment shown in FIG. 1;

FIG. 5 is a perspective view of an adapter in accordance with the invention for increasing the range of sizes of tubular forms that can be attached to the prefabricated forms shown in FIGS. 1–3; and

FIG. 6 is an elevational view of the form shown in FIG. 2 in situ ready to be filled with a settable material.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a perspective view of a first embodiment of a prefabricated form **10** in accordance with the invention. The prefabricated form **10** includes a sidewall **12** having a bottom end **14** and a top end **16**. The sidewall **12** is preferably inwardly inclined at an angle of about 45° to about 65° to facilitate the evacuation of air when the form is filled with a settable material. Integral with a bottom edge **20** of the bottom end **14** is a radial bottom flange **18**. Integral with the top end **16** is an axial top flange **22**. The top flange **22** preferably includes a plurality of inwardly stepped connectors **24** having an outer diameter that is sized to frictionally engage an inner surface of a tubular form for a structural pillar when the tubular form is forced down over a one of the connectors **24**, as will be described below with reference to FIG. 6. At the top end **16**, the sidewall **12** is curved to smoothly merge with the top flange **22**. This provides a finished pillar and footing combination cast with a prefabricated form in accordance with the invention in connection with a tubular form as shown in FIG. 6 with an additional structural advantage. Due to the smooth curvature at the point of juncture between the finished footing and the pillar, the stress point usually present at this juncture with conventional forming methods caused by the sharp angle between the pillar wall and the footing top surface is avoided. As a result, cracking of the finished column at this juncture upon movement of the surrounding soil is substantially prevented. At the bottom end **14**, the prefabricated form **10** also preferably includes a short axially-oriented portion **26** which extends upwardly from the bottom flange **18** for about 3" to provide a robust base for the footing.

FIG. 2 shows a perspective view of another embodiment of the invention wherein the sidewall **12** includes a plurality of reinforcing ribs **28**. The reinforcing ribs **28** are integrally molded with the sidewall and open inwardly. They preferably extend from the axially-oriented portion **26** of the bottom end **14** to a base of the axial top flange **22**. In the preferred embodiment of the invention, the reinforcing ribs **28** are straight and equally spaced apart. They serve to reinforce the sidewall so that it is self supporting in the event that earth is backfilled around the prefabricated form **10** before it is filled with a settable material such as concrete. The reinforcing ribs **28** also provide channels which further facilitate the evacuation of air as the form is filled with concrete from the top as will be explained below with reference to FIG. 6. It should be noted that the reinforcing ribs **28** are not necessary to ensure that air is evacuated from the prefabricated form **10**. The form **10** with or without reinforcing ribs **28** fills reliably without the entrapment of air when it is filled from the top because the angle of about 45° to about 65° of the sidewall **12** ensures that the form fills completely without the entrapment of air.

FIG. 3 is a perspective view of yet another embodiment of the prefabricated form in accordance with the invention. This embodiment is identical to the embodiment shown in FIG. 1 with the exception of the top flange. An alternate top flange **30** is adapted to receive a tubular form for a structural pillar internally of the flange **30**. Otherwise, the two forms are identical. It should be noted that this alternate flange **30** is adapted to accept an adapter for changing the size of tubular form which may be connected to the prefabricated form **10**, as will be explained below with reference to FIG. 5.

FIG. 4 is a partial cross-sectional view of the embodiment of the invention shown in FIG. 1. The radial bottom flange **18** may extend outwardly in the plane of the bottom edge **20** or inwardly, or both outwardly and inwardly as shown in the drawing. If the bottom flange **18** extends inwardly, it tends to prevent the form **10** from floating up when it is filled, in the event that earth is not backfilled around the prefabricated form **10** before it is filled with a settable material such as concrete. It should be noted, however, that the prefabricated form **10** has much less tendency to float up when filled with concrete than wooden forms built in situ. As described above, the top flange **22** preferably includes a plurality of connectors **24** which are adapted for the connection of different sizes of tubular forms for structural columns. Tubular forms are sold in a range of diameters and this construction of the axial top flange **22** increases the versatility of the prefabricated mold **10**. It should also be noted that each connector **24** is tilted slightly inwardly from an axial orientation. This is to permit a tubular form to slip easily over a top edge of a connector **24** and securely frictionally engage the connector as the tubular form is forced over the connector into contact with the slightly wider base of each connector **24**.

FIG. 5 is an elevational view of an adapter **32** for reducing the size of an axial top flange **22**, **30** of the prefabricated form **10** in accordance with the invention. The adapter **32** includes a plurality of connectors **24** that are shaped substantially identically to the connectors **24** shown in FIG. 4. The adapter **32** includes a bottom flange **34** which is adapted to fit over the top connector **24** of the top flange **22** shown in FIG. 4. The bottom flange **34** is also adapted to fit inside a properly sized top flange **30** of the embodiment shown in FIG. 3. In either instance, an adapter **32** may provide up to at least three connectors **24** for the connection of additional smaller sizes of tubular forms for structural pillars.

FIG. 6 is an elevational view of the form shown in FIG. 2 in situ ready to be filled with a settable material such as wet concrete. As explained above, a tubular form **36** commonly sold under the trade-mark SONO TUBE is forced over a connector **24** (see FIGS. 1 or 2) or into a connector **30** (see FIG. 3) of a prefabricated form **10** in accordance with the invention. Form **10** illustrated in FIG. 6 is the form shown in FIG. 2 and includes reinforcing ribs **28**. Normally, structural pillars are set on an aggregate bed **38** which is positioned in a trench below the normal frost penetration zone for the area in which the pillar is required for structural support. If the connector **24** to which the tubular form **36** connects is not the top most connector, any connectors **24** located above the connector used may be cut off using a hand saw or the like before the tubular form **36** is forced

ensure that the structural column is not weakened by the presence of the connectors. After the tubular form 36 is fitted to the prefabricated form 10 for the footer and the prefabricated form 10 is located in a proper position on the aggregate bed 38, the trench may be backfilled with earth in order to ensure that the form remains in its location while the settable material such as concrete is poured into the form. The backfilling not only stabilizes the form in its position, it also permits better access to a top end of tubular form 36 and eliminates the potential hazard of working around open trenches, etc. After the form is in position, whether backfilled or not, reinforcing steel may be inserted into the tubular form 36, as required, and a settable material such as concrete poured through the top of the tubular form 36 until both prefabricated form 10 for the footing and the tubular form 36 are filled as required. The prefabricated forms in accordance with the invention preferably have a diameter at the bottom end of about 12" to about 28" and a height of about 12" to about 18", depending on the size of the tubular form 36.

As explained above, the shape of the prefabricated form 10 ensures that the footing is filled to capacity without the entrapment of air which is evacuated along the sidewall 12 and up through the tubular form 36 as the settable material is poured in through the top of the tubular form 36. A solid, optimally shaped footing for supporting a structural column is thereby reliably produced with a minimum of expense and effort. The rigid connection of the tubular form 36 to the prefabricated form 10 for the footing not only ensures that work progresses rapidly, it also ensures that each structural pillar is placed with precision. As well, as noted above, the form can be left in the ground and actually protects the footing from moisture, thus minimizing the risk of frost damage. Thus, a significant advance in the art is realized.

Modification to above-described preferred embodiments of the invention may become apparent to those skilled in the art. The scope of the invention is therefore intended to be limited solely by the scope of the appended claims.

I claim:

1. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar, comprising:

a substantially frusto-conically shaped rigid hollow body having a circular top end and a circular bottom end spaced below and concentric with the top end, and an integral sidewall that extends between the top end and the bottom end, the sidewall being inclined at an angle in the range of about 45° to about 65° with respect to a plane of a bottom edge of the bottom end;

a bottom flange that extends radially from the bottom edge of the bottom end;

a top flange that extends axially from the top end, the top flange being adapted for the connection of at least one diameter of the tubular form, whereby the prefabricated form is positioned on a suitable substrate in a location where a structural pillar is required, a tubular form is frictionally engaged with the top flange and both forms are filled with the settable material from a top end of the tubular form to construct the structural pillar either before or after earth is backfilled around the forms.

2. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the sidewall is reinforced by a plurality of integral ribs that extend at least a part of the way between the bottom end and the top end.

3. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 2 wherein the sidewall includes an axially-oriented portion that extends upwardly a short distance from the bottom edge and the plurality of reinforcing ribs comprise a plurality of equally spaced-apart straight ribs that extend from a top edge of the axially-oriented portion of the sidewall to a base of the top flange.

4. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 3 wherein the reinforcing ribs open inwardly to provide air channels to promote the evacuation of air from the form as the form is being filled with the settable material through the tubular form for the pillar.

5. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the bottom flange extends radially outwardly from the bottom edge.

6. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the bottom flange extends radially inwardly from the bottom edge.

7. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the form is molded from a plastics material.

8. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 7 wherein the plastics material is a thermoplastic material.

9. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 8 wherein the thermoplastics material is an injection molded high density polyethylene.

10. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 8 wherein the thermoplastics material is a vacuum molded ABS.

11. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the bottom end includes a flange that extends radially outwardly therefrom in a plane coincident with the bottom edge, and the sidewall includes an axially-oriented portion that extends upwardly a short distance from the bottom edge.

12. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the top flange is adapted to accommodate the attachment of at least three different diameters of the tubular form for the pillar.

13. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the flange on the bottom end extends both radially inwardly and outwardly form the bottom edge.

14. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar as claimed in claim 1 wherein the bottom end has a diameter of about 12" to about 28" and the top end is spaced about 12" to about 18" above the bottom edge.

15. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar (as claimed in claim 1 wherein the form further includes) comprising:

a substantially frusto-conical shaped rigid hollow body having a circular top end and a circular bottom end

spaced below and concentric with the top end, and an integral sidewall that extends between the top end and the bottom end, the sidewall being inclined in an angle in the range of about 45° to about 65° with respect to a plane of a bottom edge of the bottom end;

a bottom flange that extends radially from the bottom edge of the bottom end;

a top flange that extends axially from the top end, the top flange being adapted for the connection of at least one diameter of the tubular form.

an adapter for mounting to the top flange, the adapter being adapted to permit the connection of at least one diameter of the tubular form for the pillar that is smaller than the smallest diameter of the top flange.

whereby the prefabricated form is positioned on a suitable substrate in a location where a structural pillar is required, the tubular form is frictionally engaged with the top flange and both forms are filled with a settable material from a top end of the tubular form to construct the structural pillar either before or after earth is backfilled around the forms.

16. A prefabricated form for molding a footing of a settable structural material at a bottom end of a tubular form for a structural pillar, comprising:

a substantially tapered rigid hollow body having a top end of a first area and a bottom end of a second area larger than the first area and concentric with the top end, and an integral side wall extending between the top end and the bottom end, the side wall being inclined at an angle in the range of about 45° to about 65° with respect to a plane of a bottom edge of the bottom end; and

a circular top flange that extends axially from the top end, the top flange being adapted for the connection of at least one diameter of the tubular form, whereby the prefabricated form is positioned on a suitable substrate in a location where a structural pillar is required, a tubular form is frictionally engaged with the top flange and both forms are filled with the settable material from a top end of the tubular form to construct the structural pillar either before or after earth is backfilled around the forms.

* * * * *

FOOTING FORM

FIELD OF THE INVENTION

[0001] This invention relates to concrete forms for materials such as concrete, polymer concrete or the like and, in particular, to forms for molding footings for structural pillars used in the construction industry.

BACKGROUND OF THE INVENTION

[0002] The use of structural pillars made from a concrete material is well known and widely practiced in the construction industry. Such pillars are typically poured into a tubular pillar form made of spirally wrapped paper, although other prefabricated pillar forms are well known and commonly used for this purpose. According to most building codes, structural pillars must be supported by a footing located below the level of maximum frost penetration and usually set on a coarse aggregate bed to ensure adequate drainage. The footing which is normally also made of concrete material provides support for the pillar and its load. Traditionally, wooden footing forms built on site were used. More recently, prefabricated forms have been introduced, which overcome the problems encountered with wooden forms, such as the need for at least one cross-piece for supporting the tubular pillar form, the labour intensive and time consuming assembly and disassembly of the wooden forms, improper filling when concrete is fed through the top of the tubular form, and the need to wait until the footing is set before backfilling.

[0003] Various types of prefabricated footing forms exist, most of which are somewhat tapered towards the top where the pillar form is adjoined. Bell-shaped (Joubert, US 4,830,543), and conical (Jackson, US 3,108,403; Miller 1,296,995; Gebelius, US 4,648,220) or frusto-conical (Wells, US 4,673,157; Nagle, US 5,271,203) forms are known, with the latter being most common. A conical shape facilitates proper filling of the form with concrete material, makes the form stable and able to support the pillar form, and sometimes even allows for backfilling prior to pouring of the concrete material. However, tapered prefabricated forms have certain structural limits. Swinimer (US 5,785,459) discloses that in order to achieve complete filling of a conical form without vibrating the concrete material, the pitch of the sidewall must be between about 45° and about 65°. Such a sidewall angle is impractical for industrial size applications with large footprint (bottom diameter), for example above 30

inch diameter, since it will lead to an impractically high form and high material cost. The higher the footing, the deeper it must be buried to remain below frost level. Moreover, the transition region between the footing and the pillar, which is a peak stress point of the pillar/footing structure should be located as far below grade as possible to reduce the lateral load at this transition region. Thus, since the vertical location of this transition region is governed by the height of the footing form, forms of large footprint and a sidewall angle of 45° or above are impractical and uneconomical due to high installation and/or excavation cost. Consequently, a more economical and practical prefabricated form is desired.

SUMMARY OF THE INVENTION

[0004] It is an object of the invention to provide a prefabricated form for the molding of a concrete footing for a structural pillar, which form overcomes the above mentioned disadvantages.

[0005] It is another object of the present invention to provide a prefabricated form for molding a pillar footing of a concrete structural material, which form is shaped to ensure complete filling with the concrete material without entrapped air pockets, while preventing excessive height of the form at large footprints.

[0006] It is still another object of the invention to provide a prefabricated form for molding a pillar footing of a concrete structural material, which form is shaped to prevent cave-in of the form upon backfilling prior to filling of the form with the concrete material.

[0007] It is yet a further object of the invention to provide a prefabricated pillar form for forming a footing of a concrete structural material which is adapted to accommodate a plurality of diameters of tubular pillar forms.

[0008] These objects are now achieved in a prefabricated footing form in accordance with the invention by controlling the dimensions of the form of substantially tapered shape according to strict structural relationships in order to reduce the amount of material needed for manufacture of the form, to ensure proper filling of the form with concrete material, to maintain the height of the form within practical limits, and to prevent cave-in upon backfilling of the form prior to pouring of the concrete material.

[redacted]

[0009] In accordance with the invention, a preferred footing form for molding a footing of concrete material at a bottom end of a concrete column, includes

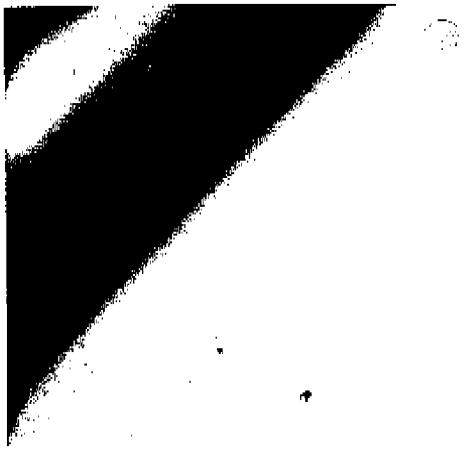
[0010] a substantially tapered rigid hollow body having a circular top end of a first diameter D_T, a bottom end of a larger, second diameter D_B, the bottom end defining a base plane and being concentrically, vertically spaced from the top end by a height H, and an integral side wall extending between the top and bottom ends, at least a portion of the sidewall being inclined at a sidewall angle below 45° with respect to the base plane, the sidewall having a length S parallel in axial direction of the footing form;

[0011] a circular top flange at the top end for fittingly supporting a prefabricated tubular column form, and a bottom flange at the bottom end for supporting the footing form on a suitably prepared substrate;

[0012] whereby the dimensions of D_T, D_B, H and S are selected such that $S \leq 2.4h$ for reducing the amount of material used to manufacture the footing form, $S \geq 0.55\Delta D$, with $\Delta D = D_B - D_T$ for preventing cave-in of the form upon exterior backfilling prior to molding of the footing, $D_B \geq 1.8D_T$ for lateral stability of the footing form, $\frac{1}{4}\Delta D \geq H \geq 1/4\Delta D$ for $D_B \geq 24$ inches for preventing excessive footing form heights, and $D_T \geq \frac{1}{2} D_B - H$ for ensuring proper filling of the footing form with a concrete mixture of about 3000psi to 4000psi.

[0013] The invention therefore provides a prefabricated form for molding a footing of a concrete structural material at a bottom end of a tubular form for a pillar. The form is preferably molded from a thermoplastic resin such as high density polyethylene or ABS, although any other rigid, water resistant material with adequate strength is also suitable. The form is molded as a unit and is tapered in profile. It includes a bottom end with a radial flange and a top end having a top flange that is sized to frictionally engage a tubular form of a specific diameter. The flange on the top end may be adapted to engage the tubular pillar form either internally or externally, but preferably it is adapted to engage the form internally. The top flange is preferably constructed for connection of tubular forms of different diameters.

[0014] Preferably, the prefabricated footing form can be manufactured in a range of sizes each adapted to support a number of different diameter tubular forms by way of the top



flange.

[0015] It is a principal advantage of the prefabricated footing form in accordance with the invention that it has a relatively small height even for large footprints, while still permitting backfilling before the concrete is poured, preventing the hazard of open trenches.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The invention will now be described by way of example only and with reference to the following drawings, wherein:

[0017] FIG. 1 is a perspective view of a first embodiment of the prefabricated form in accordance with the invention;

[0018] FIG. 2 is a perspective view of another embodiment of the prefabricated form in accordance with the invention;

[0019] FIG. 3 is a perspective view of yet another embodiment of the prefabricated form in accordance with the invention;

[0020] FIG. 4 is a partial cross-sectional view of the embodiment shown in FIG. 1; and

[0021] FIG. 5 is an elevational view of the form shown in FIG. 2 in situ ready to be filled with concrete material.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] Despite the structural limitations taught in the prior art, it has now been surprisingly found that a form having a sidewall angle below 45° will reliably fill with a concrete mixture of at most about 3000psi, as long as other structural limitations of the form follow certain strict relationships. Through extensive research, the applicant has developed certain structural relationships which, if strictly followed, allow the manufacture of

prefabricated forms that will still reliably fill with a concrete mixture of up to 4500psi, despite a sidewall angle below 45° and even as low as about 30°, and without vibration of the concrete. However, if these structural limitations as developed in accordance with the invention are not followed, the form may not fill properly, or even more disastrous results may occur, such as cave-in of the form.

[0023] FIG. 1 shows a perspective view of a first embodiment of a prefabricated footing form 10 in accordance with the invention. The prefabricated form 10 includes a substantially tapered right hollow body 12 having a circular top end 16, of a first diameter D_T and a bottom end 14 of a second diameter D_B larger than the first diameter, the top and bottom ends 16, 14 being concentrically aligned along a vertical axis of the body 12. An integral sidewall 17 extends between the top and bottom ends 16, 14, which is preferably inwardly inclined at an angle of about 30° to about 45° to facilitate the evacuation of air when the form is filled with a concrete material. Integral with a bottom edge 20 of the side wall 17 is a bottom flange 18 which includes a substantially axially oriented portion 26 and a radial portion 19. The substantially axially-oriented portion 26 extends upwardly from the radial portion 19 for about 3" to 8" and allows for the production of forms 10 of different overall height. Changes in height of the axially oriented portion can also be used to control the thickness of the base of the footing, at its maximum diameter. Integral with the top end 16 is an axial top flange 22. The top flange 22 preferably includes a plurality of inwardly stepped connectors 24 for engagement with a tubular column form. The connectors 24 are preferably sized to frictionally engage the inner surface of the column form when the tubular form is forced down over one of the connectors 24, as will be described below with reference to FIG. 5. This is achieved by the diameter of each connector increasing from a diameter at the top edge 25 which is slightly smaller than the inner diameter of the column form to a diameter at the bottom end 27 of the connector which is slightly larger than the diameter of the column form. In this way, the column form jams on the connector as it is forced downward thereon. The wall of the connector 24 is preferably inclined from vertical at an angle of up to 5°. At the top end 16 of the footing form 10, the sidewall 17 is preferably somewhat curved to smoothly merge with the top flange 22. This provides a finished pillar and footing combination cast

with a prefabricated form in accordance with the invention in connection with a tubular form as shown in FIG. 5 with an additional structural advantage. Due to the smooth curvature at the point of juncture between the finished footing and the pillar, the stress point usually present at this juncture with conventional forming methods caused by the sharp angle between the pillar wall and the footing top surface is avoided. As a result, the danger of cracking of the finished column at this juncture upon movement of the surrounding soil is substantially reduced. The dimensions of the footing form 10 are carefully chosen to ensure proper filling of the form with concrete without the need for vibrating the concrete. In this respect, the inventor surprisingly discovered that footing forms with sidewall angles below 45° and above 30° will reliably fill if other dimensions of the form, such as sidewall length, top and bottom diameter, and height are controlled within strict limits. Moreover, forms for industrial applications and intended to support large loads require relatively large footprints (bottom diameters) of 32" to 48" or even higher. However, footing forms having a sidewall angle of 45° or above are not practical for such applications, since they would have an excessive overall height. Since the footing according to most building codes must be placed below maximum frost depth, excessively high footing forms would result in uneconomical installation and excavation cost. Excessively high forms also require a lot of material to manufacture and fill and, thus, are costly. To overcome these problems and to ensure proper filling, the inventor has determined through extensive experimentation that the following structural limitations will lead to the desired footing form suitable for industrial applications. The sidewall length must be at most 2.4 times the height of the form to minimize the amount of material required for manufacture of the form. The length of the side wall must be at most 0.55 times the difference in diameter between the top and bottom diameters to prevent footing form cave-in upon backfilling prior to filling the form with concrete. For lateral stability of the form, the bottom diameter 14 must be at least 1.8 times the top diameter 16. The height of the footing must be controlled to be in the range of ½ to ¼ of the difference in diameter between the top and bottom diameters, to prevent excessive footing form heights. It has been discovered by the inventor that even if the sidewall is inclined at an angle lower than the slope angle of the concrete used for filling of the form, complete filling of the form without air entrapment can be achieved by enlarging the top diameter sufficiently, and using an accordingly large column form, so that the weight of

the concrete in the column form will force the concrete into the most remote corners of the footing form and force out air through the enlarged to diameter and column form. Thus, the relationship between the top and bottom diameters at the top and bottom ends 16, 14 respectively must be controlled to ensure proper filling of the form. In particular, the top diameter must be at least as large as the height of the footing less half the bottom diameter.

[0024] Testing of forms with different dimensional and structural limitations was carried out in accordance with CCMC's Technical Guide for Bell Shape Foundation Form, Master Format Section :03315, for below grade applications. Cardboard column forming tubes of appropriate diameter, commercially available under the trademark SONOTUBE, were attached to the footing forms tested. The cardboard tubes were fastened to the appropriate top flange of the footing form with 1 inch wood screws. The footing forms were placed in a 54 inch deep trench onto undisturbed soil. Backfilling with soil was then carried out in even lifts of 6 inch to 18 inch. The soil around the forms was tamped using a mechanical tamper after each lift. The concrete was subsequently poured directly into the form through the cardboard construction tube from a concrete truck and in lifts of about 24 inches, until the construction tube was completely filled. The concrete was rodded about 12 times after each lift. The concrete used was specified to have a compressive strength of 3500 psi and was a mixture of 3/4 inch crushed stone aggregate, standard sand, and type 10 Portland cement. The concrete had a slump of 3. After a setting time of two weeks, the forms were excavated and removed from the ground for evaluation. Footing forms constructed to the strict structural limitations according to the present invention were found to have withstood backfilling without cave-in or deformation and to have filled completely with concrete. Even for very large diameters such as 48 inches and low sidewall lengths resulting in sidewall angles of as low as 30°, the concrete flowed into the corners with no voids or honeycombing. It was also surprisingly discovered that the anchor flange 40 (see Figs. 4 and 5) which will be discussed in more detail below not only anchors the form against lateral movement on the supporting surface during backfilling, but provides additional rigidity and strength to the form. The anchor flange when forced into the supporting medium maintains the geometric shape of the form and prevents deformations of the form at the bottom end, which would severely

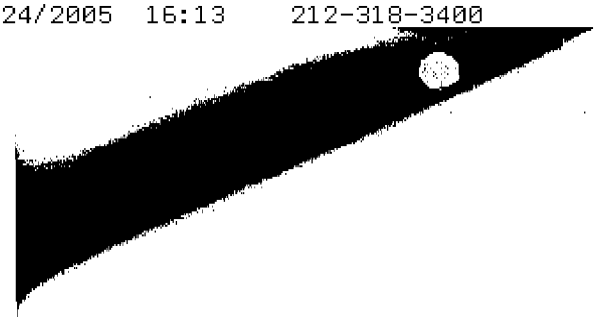
decrease the structural strength of the form. Especially for low sidewall angles (25 to 40°), maintaining the shape of the bottom flange resulted in a surprising structural strength increase compared to forms without anchor flange. The strength increase was significant enough to allow not only backfilling of the form before pouring of the footing, but even compacting of the backfill around the form. This provides an important additional advantage, since compacting of the backfill after setting of the footing and column is avoided. Moreover, if the backfill is not compacted, the soil around the column will gradually settle and sag, requiring the contractor to return to the job site months after completion of the footing to complete the backfill. This problem is also overcome with a form which allows backfilling prior to pouring of the footing.

[0025] An exemplary and non-exhaustive listing of footing forms in accordance with the invention and their structural paramcters are given in the following Table I. All measurements are in inches.

TABLE 1

Ex.	D_T	D_B	S	H	ΔD
1	18	36	10.5	5.5	18
2	16	36	11.7	6.0	20
3	14	36	12.8	6.5	22
4	12	36	13.9	7	24
5	18	48	17.5	9	30
6	20	48	16.4	8.5	28
7	22	48	15.3	8	26
8	24	48	14.1	7.5	24

[0026] FIG. 2 shows a perspective view of another embodiment footing form of the invention wherein the sidewall 12 includes a plurality of reinforcing ribs 28. The reinforcing ribs 28 are integrally molded with the sidewall and open inwardly. They preferably extend from the axially-oriented portion 26 to a base of the axial top flange 22. In the preferred embodiment of the invention, the reinforcing ribs 28 are straight and equally spaced apart. They serve to reinforce the sidewall so that it is self supporting in the event that earth is backfilled around the prefabricated form 10 before the form is filled with a settable material such as concrete. The reinforcing ribs 28 also provide channels which further facilitate the



evacuation of air as the form is filled with concrete from the top as will be explained below with reference to FIG. 5. Moreover, the reinforcing ribs 28 are preferably provided with a multiplicity of small perforations 29 which are sufficiently small to prevent concrete or cement slurry leakage while permitting air to pass. These perforations 29 or air holes further help in evacuating entrapped air from the form 10 during filling. It should be noted that the reinforcing ribs 28 are not essential to ensure that air is evacuated from the prefabricated form 10. The form 10 with or without reinforcing ribs 28 fills reliably without the entrapment of air and without the need for vibrating the concrete fill when it is filled from the top through the tubular form for the structural pillar. Moreover, the air holes 29 while not absolutely necessary for proper filling of the form, in most cases provide for a faster filling of the form.

[0027] FIG. 3 is a perspective view of yet another embodiment of the prefabricated form in accordance with the invention, including a modified alternate top flange 30 adapted to internally receive a tubular form for a structural pillar.

[0028] FIG. 4 is a cross-sectional view of the embodiment of the footing form shown in FIG. 1. The radial flange portion 19 of bottom flange 18 may extend radially outwardly or inwardly, or both outwardly and inwardly as shown in the drawing. If the radial flange portion 19 extends inwardly, it tends to prevent the form 10 from floating up when it is filled, in the event that earth is not backfilled around the prefabricated form 10 before it is filled with a settable material such as concrete. It should be noted, however, that the prefabricated form 10 has much less tendency to float up when filled with concrete than wooden forms built in situ. Bottom flange 18 preferably includes not only the radial flange portion 19 but also an axial anchor flange 40 which projects downwardly in a direction parallel to the axis of the form 10. The anchor flange 40 may be a continuous cylindrical lip or may be in the form of multiple sections or spikes, which project downwardly. The anchor flange 40 is used for stabilizing the form 10 and especially for maintaining the shape of the bottom end 14 upon backfilling. A continuous lip is especially practical for softer soils or supporting media, while multiple lip portions or spikes are preferred for coarse aggregate and the like.

[0029] As described above, the top flange 22 preferably includes a plurality of

connectors 24 which are adapted for the connection with different sizes of tubular forms for structural columns. Tubular forms are sold in a range of diameters and this construction of the axial top flange 22 increases the versatility of the prefabricated form 10. It should also be noted that the sidewall of each connector 24 is tilted slightly inwardly from an axial orientation.

[0030] FIG. 5 is an elevational view of the form shown in FIG. 2 *in situ* ready to be filled with a concrete material such as wet concrete. As explained above, a tubular form 36 commonly sold under the trade-mark SONO TUBE is forced over a connector 24 (see FIGS. 1 or 2) or into a connector 30 (see FIG. 3) of a prefabricated form 10 in accordance with the invention. Footing form 10 illustrated in FIG. 5 includes reinforcing ribs 28. Normally, structural pillars are set on an aggregate bed 38 which is positioned in a trench below the maximum frost penetration for the respective geographical region of the installation site. If the tubular form 36 is not mounted to the uppermost connector 24, any connectors 24 located above the one actually used may be cut off using a hand saw or the like before the tubular form 36 is seated. This ensures that the structural column is not weakened by the presence of a restriction caused by the unused connectors. The tubular form 36 is preferably fastened at multiple locations to the connector 24, preferably with screws. This results in a more reliable connection, but at the same time makes the top opening of the form 10 more rigid, which means it will more reliably maintain its circular shape. After the tubular form 36 is fitted to the prefabricated form 10 and the latter is located in a proper position on the aggregate bed 38, the stabilizing anchor flange 40 is forced into the aggregate or soil 39 on which the form 10 is supported, until the radial lip 19 of the bottom flange 18 comes to rest against the aggregate or soil 39. This stabilizes the form 10 not only against lateral movement during backfilling, but also stabilizes the shape of the bottom flange 18 and thereby the shape of the form as a whole, as discussed above. The radial flange portion 19 is preferably constructed sufficiently strong to permit forcing of the axial flange portion 40 into the supporting surface by stepping onto the radial flange portion 19. Subsequently, the trench may be backfilled with earth in order to ensure that the form remains in its location while the concrete material such as concrete is poured into the form. The backfilling not only further stabilizes the form in its position, it also

permits better access to a top end of tubular form 36 and eliminates the potential hazard of working around open trenches, etc. After the form is in position, whether backfilled or not, reinforcing steel may be inserted into the tubular form 36, as required, and a concrete material such as concrete poured through the top of the tubular form 36 until both the prefabricated form 10 and the tubular form 36 are filled as required.

[0031] As explained above, the shape of the prefabricated form 10 aids the filling of the footing form to capacity without the entrapment of air. The air is evacuated along the sidewall 12 and up through the tubular form 36 or through the perforations or vent openings 29 as the concrete material is poured in through the top of the tubular form 36. A solid, optimally shaped footing for supporting a structural column is thereby reliably produced with a minimum of expense and effort. The rigid connection of the tubular form 36 to the prefabricated form 10 for the footing not only ensures that work progresses rapidly, it also ensures that each structural pillar is placed with precision. As well, as noted above, the form can be left in the ground and actually protects the footing from moisture, thus minimizing the risk of frost damage. Thus, a significant advance in the art is realized.

[0032] Modification to above-described preferred embodiments of the invention may become apparent to those skilled in the art. The scope of the invention is therefore intended to be limited solely by the scope of the appended claims.

CLAIMS

1. A prefabricated footing form for molding a footing of concrete material at a bottom end of a concrete column, comprising

a substantially tapered rigid hollow body having a vertical axis, a circular top end of a first diameter D_T, a bottom end of a second diameter D_B larger than the first diameter, the top and bottom ends being concentrically aligned along the vertical axis, the top and bottom ends being vertically spaced apart at a height H, and an integral side wall extending between the top and bottom ends, at least a portion of the sidewall being inclined at a sidewall angle below 45° with respect to the base plane, the sidewall having a length S from the top to the bottom end;

a circular top on the flange side wall for fittingly supporting a prefabricated tubular column form, and a bottom flange for supporting the footing form on a suitably prepared substrate;

whereby the dimensions of D_T, D_B, H and S are selected such that $S \leq 2.4h$ for reducing the amount of material used to manufacture the footing form, $S \geq 0.55\Delta D$, with $\Delta D = D_B - D_T$ for preventing cave-in of the form upon exterior backfilling prior to molding of the footing, $D_B \geq 1.8D_T$ for lateral stability of the footing form, $\frac{1}{2}\Delta D \geq H \geq 1/4\Delta D$ for $D_B \geq 24$ inches for preventing excessive footing form heights, and $D_T \geq 0.5\ D_B - H$ for ensuring proper filling of the footing form with a concrete mixture of about 3000psi to 4000psi.

2. A prefabricated footing form as defined in claim 1, wherein the sidewall is reinforced by a plurality of integral ribs that extend at least a part of the way between the bottom end and the top end.

3. A prefabricated footing form as defined in claim 2, wherein the sidewall includes an axially-oriented portion that extends upwardly a short distance from the bottom end and the

plurality of reinforcing ribs comprise a plurality of equally spaced-apart ribs that extend from a top edge of the axially-oriented portion of the sidewall to a base of the top flange.

4. A prefabricated footing form as defined in claim 3, wherein the reinforcing ribs open inwardly to provide air channels to promote the evacuation of air from the form as the form is being filled with the settable material through the tubular form for the pillar.

5. A prefabricated footing form as defined in claim 1, wherein the bottom flange extends radially outwardly from the bottom edge.

6. A prefabricated footing form as defined in claim 1, wherein the bottom flange extends radially inwardly from the bottom edge.

7. A prefabricated footing form as defined in claim 1, wherein the form is molded from a plastics material.

8. A prefabricated footing form as defined in claim 7, wherein the plastics material is a thermoplastic material.

9. A prefabricated footing form as defined in claim 8, wherein the thermoplastics material is an injection molded high density polyethylene.

10. A prefabricated footing form as defined in claim 8, wherein the thermoplastics material is a vacuum molded ABS.

11. A prefabricated footing form as defined in claim 1, wherein the bottom end includes a flange that extends radially outwardly therefrom in a plane coincident with the bottom edge, and the sidewall includes an axially-oriented portion that extends upwardly a short distance from the bottom edge.

12. A prefabricated footing form as defined in claim 1, wherein the top flange is adapted to accommodate the attachment of at least three different diameters of the tubular form for the pillar.

13. A prefabricated footing form as defined in claim 1, wherein the flange on the bottom end extends both radially inwardly and outwardly form the bottom edge.

14. A prefabricated footing form as defined in claim 1, wherein the bottom end has a diameter of about 12" to about 48".

15. A prefabricated footing form as defined in claim 1, wherein the bottom flange includes an axial flange portion projecting downwardly in the installed condition for preventing lateral movement of the form on a supporting substrate by engaging into the substrate and to stabilize the shape of the bottom end.

ABSTRACT

A prefabricated concrete form for the pouring of a footing for a structural pillar is disclosed. The form is preferably constructed from a thermoplastic such as a high density polyethylene or ABS and is molded as a single disposable unit. The form is bell-shaped and has dimensions which render it useful in industrial size applications with large footprints. The dimensioning of the form also reduces the amount of material used for the manufacture of the form, allows the form to be backfilled without cave-in and to reliably support a tubular form for the pillar without an additional bracing or supporting structure. The form is in particular a low profile form wherein the sidewall is inclined at an angle below 45° relative to the bottom edge. A top flange of the form is preferably adapted to accommodate two or more different diameters of the tubular form for the structural pillar. The sidewall may include integral ribs which open inwardly to facilitate evacuation of air as the form is filled and to lend rigidity to the sidewall. The sidewall may further include vent openings for the escape of air which is possibly temporarily entrapped during filling of the form. The advantage is an inexpensive form which does not have an excessive height despite large footprints, fills reliably and supports a tubular form for a pillar without the need for cross-pieces, even at sidewall angles below 45°.

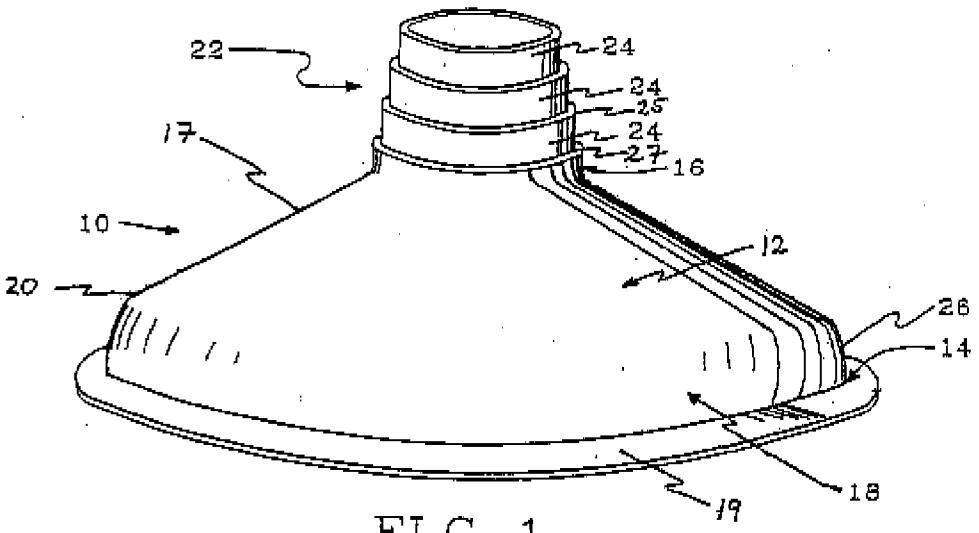


FIG 1

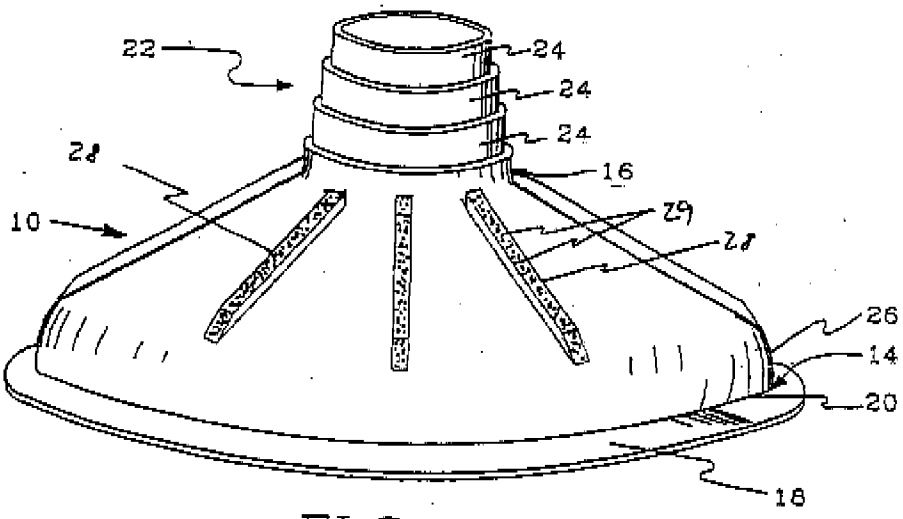


FIG 2

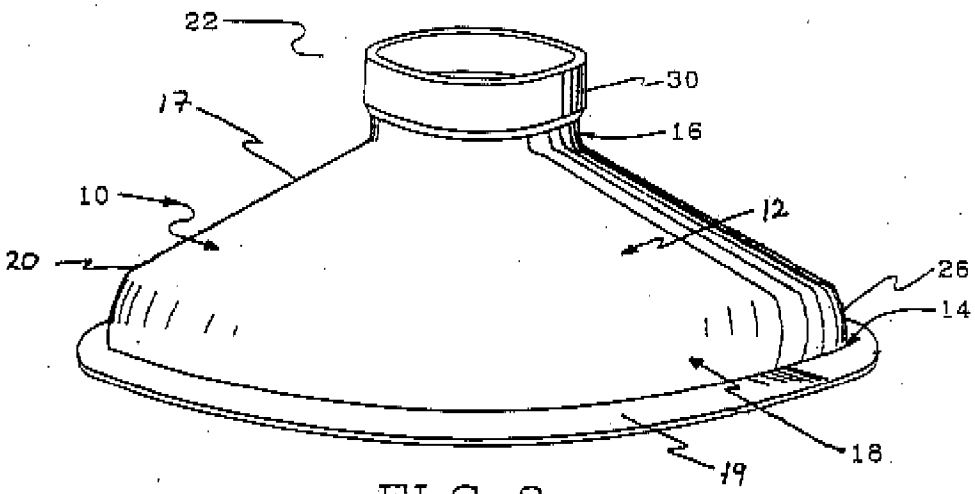


FIG 3

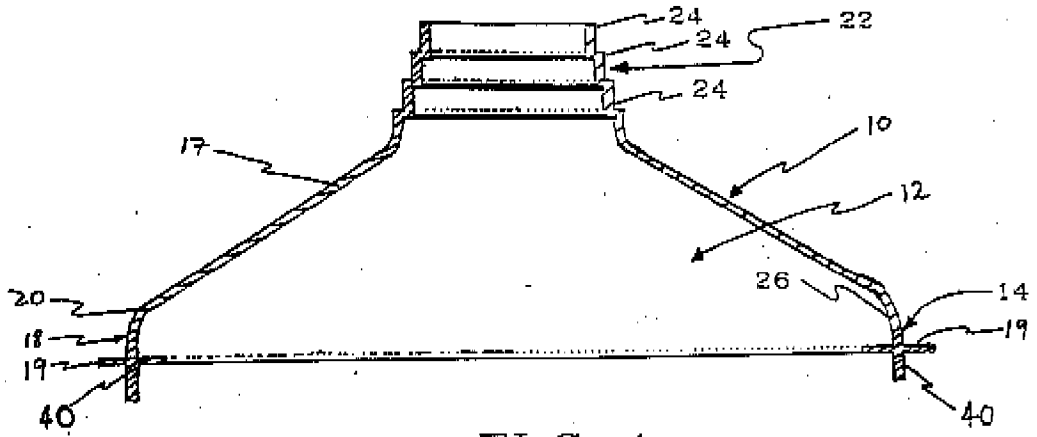


FIG 4

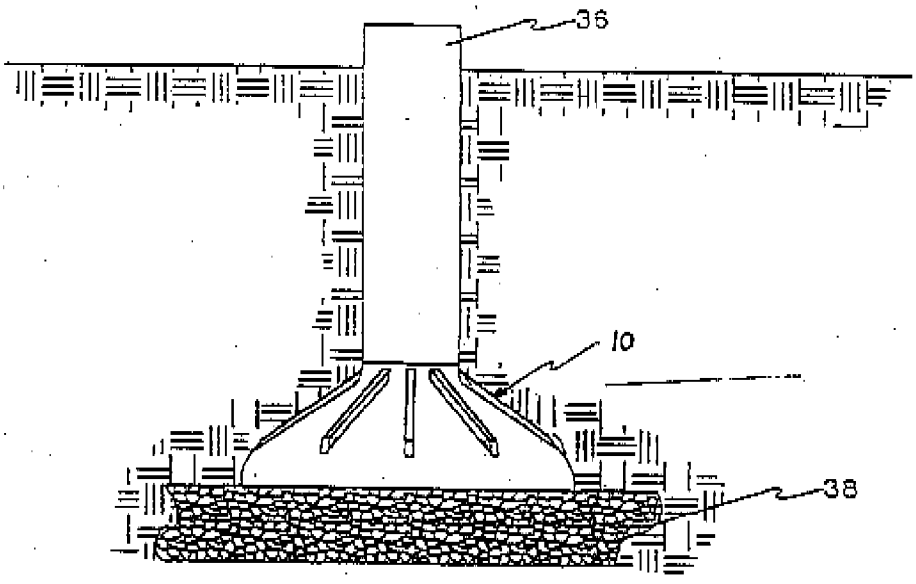


FIG 5

20 04 NO. ____
THIS IS EXHIBIT " C "
REFERRED TO IN THE ~~AFFIDAVIT~~ Declaration
OF G.F. Philip Kenney
SWORN TO THIS 25th DAY
OF October A.D. 20 04

Lois D. Smith
A Commissioner of the Supreme Court of Nova Scotia

employment compensation is paid to either Fickes or Swinimer. Net profits are to be determined in accordance with the generally accepted accounting principles.

1X. PATENT

9. (a) In the event that the company does obtain a patent or patents, Swinimer shall receive Preference Shares in an amount equal to his legal costs incurred in obtaining same.

(b) The company and/or Swinimer have applied to patent "Big Foot" footing design and the shareholders agree that if a patent or patents are approved that the patent or patents shall be owned solely by the Company. Swinimer agrees to pay for the cost of securing both United States and Canadian patents.

X. MISCELLANEOUS

10.01 The Company shall purchase life insurance on Fickes and Swinimer in the amount of Two Hundred Thousand Dollars ($200,000.00), subject only to the insurance premiums being reasonable and shall not commence until there is sufficient cash flow generated from sales.

10.02 Fickes shall have sole cheque signing authority.

10.03 It is agreed that the company shall pay one-half of the utilities for the office space which Swinimer now uses. The company shall pay no other rental or associated expenses.

10.04 The Company agrees, commencing November 1, 1996, to hire a secretary at $9.00 per hour, but only paid by the company when there is sufficient cash generated from sales. It is understood by the parties that Swinimer will pay for the secretarial services provided until such time as the company can afford to provide reimbursement by the Company to Swinimer.