Concrete Form and Method of Molding Concrete Columns Therewith

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1. This invention relates to paper forms for use in molding concrete pillars or columns and the like.

The erection of concrete structures is generally accomplished by building wooden forms into which the concrete is poured and which are removed after the concrete has set. In concrete construction, prefabricated forms of metal have also been adapted for use, but in any form work for concrete construction is characterized by relatively high costs for the form material, particularly when metal forms are used, and by high handling costs as well.

It has herefore been proposed to use paper tubes as concrete forms in the construction of pillars and columns and the like, in order to avoid the high costs of conventional types of form work. This proposed use of paper tubes has not proved satisfactory, however, because of the great difficulty encountered in stripping them from the concrete after it has set. The difficulty with stripping arises from the fact that paper surfaces presents a multitude of protruding or extending fibers that become imbedded or otherwise adhere to the concrete as it dries. Moreover, there is a severe abrasive action by the concrete on the inner surface of a paper tube during pouring which further roughens the paper surface and increases its tendency to adhere.

Attempts to cure this difficulty by conditioning the inside surface of the tubes with a coating or the like have not previously been successful because the protruding fibers on the paper surface are not completely smoothed down and covered over by most coatings; and, even more importantly, the few coating materials that do appear to cover over the protruding fibers satisfactorily do not in general impart to the paper surface sufficient abrasion resistance to avoid roughening during pouring.

In accordance with the present invention we have now found that paper tubes may be uniquely conditioned for use as concrete forms by providing them with a liner film of polyethylene. Polyethylene is not only well suited as a coating material so that it can be applied to form a liner for the paper tubes readily and efficiently. It is also a surface has surprising tenacity quality which gives it a good covering power as regards the protruding paper fibers, and exceptional abrasion resistance. A paper tube lined with polyethylene in accordance with the present invention can be stripped easily from concrete that has been poured and set therein, and leaves an excellent surface finish on the concrete.

The present invention is described in further detail below in connection with the accompanying drawings, in which:

Fig. 1 is an elevation of a tubular concrete form of paper constructed in accordance with the present invention;

Fig. 2 is a fragmentary sectional detail taken generally at 2—2 in Fig. 1;

Fig. 3 is a further fragmentary sectional detail illustrating the manner of preparing the polyethylene liner for use in the form shown in Fig. 1;

Fig. 4 is an elevation, partly in section, showing a typical reinforced concrete structure in the course of construction with a concrete form of the present invention; and

Fig. 5 is a perspective view illustrating the use of cutting wires for use in stripping the form.

Referring now in detail to the drawings, and more particularly at first to Figs. 1 and 2, the concrete form of the present invention is preferably formed by spirally winding a plurality of paper strips in the conventional superimposed relationship to form a laminated or multi-ply tubular body 10 of desired length and wall thickness. The spirally wound paper strips are bonded together by means of a suitable adhesive interspersed between them as they are wound, so that the resulting multi-ply tube wall, as indicated at 12 in Figs. 1 and 2, is of sufficient thickness to support adequately the load imposed in confining the concrete as it is poured therein.

The polyethylene liner film is preferably provided according to the present invention by applying it as indicated at 14 in Fig. 3 to the paper strip 16 that will be used to form the inner spiral winding of the tubular body 10. In this way, the spiral winding operation may be carried out in the usual manner in forming the tubular body 10 without any special procedure whatever being needed to incorporate the liner film 14. Alternatively, the polyethylene coated paper strip might be used in the same manner to form the outer spiral winding of the tubular body 10 in instances where it was desired to provide an exterior molding surface conditioned in accordance with the present invention so that the tubular body 10 could be used as a molding core.

The application of the liner film 14 to the paper strip 16 may be carried out conveniently by passing an extruded polyethylene sheet together with the paper strip 16 directly through the nip of heated calendar rolls (not shown) which are driven at a speed sufficiently in excess of the rate of extrusion to stretch the polyethylene sheet as it is extruded and thereby extend it to obtain the
A film thickness of from about .001” to .002” will usually be found to give satisfactory results.

The use of a concrete form constructed in accordance with the present invention is illustrated in Fig. 4, in which a tubular body 10 having a liner film 14 is shown positioned by suitable bracing as at 16 to act as a form for a reinforced concrete pillar 20. The tubular body 10 is shown in this instance as being of relatively short length, but it might as well be shown in any other length desired for it may be provided in whatever length is needed in a particular instance.

Stripping of the tubular body 16 from the concrete after it has set may be accomplished either by unwrapping its spiral plies from the formed concrete, or by cutting it longitudinally and then unwrapping it. The latter method may be facilitated, if desired, by positioning cutting wires as shown in Fig. 5 at 22 in the tubular body 10 before the concrete is poured. By pulling this wire 22 when the tubular body 10 is to be removed it may be cut as indicated at 24 in Fig. 5 along its entire length to allow removal of the body 10 in halves.

The present invention has been described above for purposes of illustration only, and is not intended to be limited by this description except as defined in the appended claims.

We claim:
1. A form for molding concrete pillars and the like comprising a spirally wound tubular paper body having sufficient rigidity to support a column of concrete mix poured therein, said body being coated interiorly with a film of polyethylene, whereby adhesion of the mold walls to the cured concrete is prevented.

2. A form adapted for use in molding concrete articles comprising a multi-ply spirally wound paper tube of appropriate size and wall thickness to support a body of concrete poured therein and having a film of polyethylene over the inner surface thereof bonded to the inner spiral winding of said tube, whereby the form is protected from the abrasive action of the concrete when poured and sticking of said tube to said concrete is prevented.

3. A concrete form adapted for molding pillars and the like comprising a spirally wound, self-supporting, laminated paper body having an interior polyethylene liner bonded to the inner spiral winding thereof and being coextensive therewith whereby the paper body is protected from the abrasive action of concrete when poured therein and adhesion of the paper body to the concrete is prevented.

4. A cylindrical form for molding concrete columns and the like, comprising a paper tube constructed from a plurality of piles of spirally wound paper of sufficient strength and rigidity to support a column of concrete mix poured therein, the innermost ply of said paper plies having a continuous, impervious coating thereon of extruded polyethylene resin of a thickness of the order of 0.002”, said coating having sufficient elasticity and resistance to abrasion to prevent cracking or tearing of the coating when the concrete mix is poured in the form in contact with said coating, and said coating preventing penetration therethrough of the concrete mix and enabling stripping of the form, with the coating intact, from the poured concrete column upon setting of the concrete.

5. A method for molding concrete columns and the like, comprising setting in the desired location a paper tube constructed from a plurality of piles of spirally wound paper of sufficient strength and rigidity to support a column of concrete mix, the innermost ply of said paper plies having an impervious, thin coating thereon of extruded polyethylene resin, said coating having sufficient elasticity and resistance to abrasion to prevent cracking or tearing of the coating when poured with the concrete mix, pouring said concrete mix into the tube in contact with said coating and in sufficient amount substantially to fill the tube, said polyethylene resin coating preventing penetration therethrough of the water in the concrete mix, allowing sufficient time for the concrete mix to set and harden within the surrounding tube, and then stripping the tube from the hardened concrete column, said polyethylene coating enabling easy stripping of the tube from the surface of the concrete column.

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