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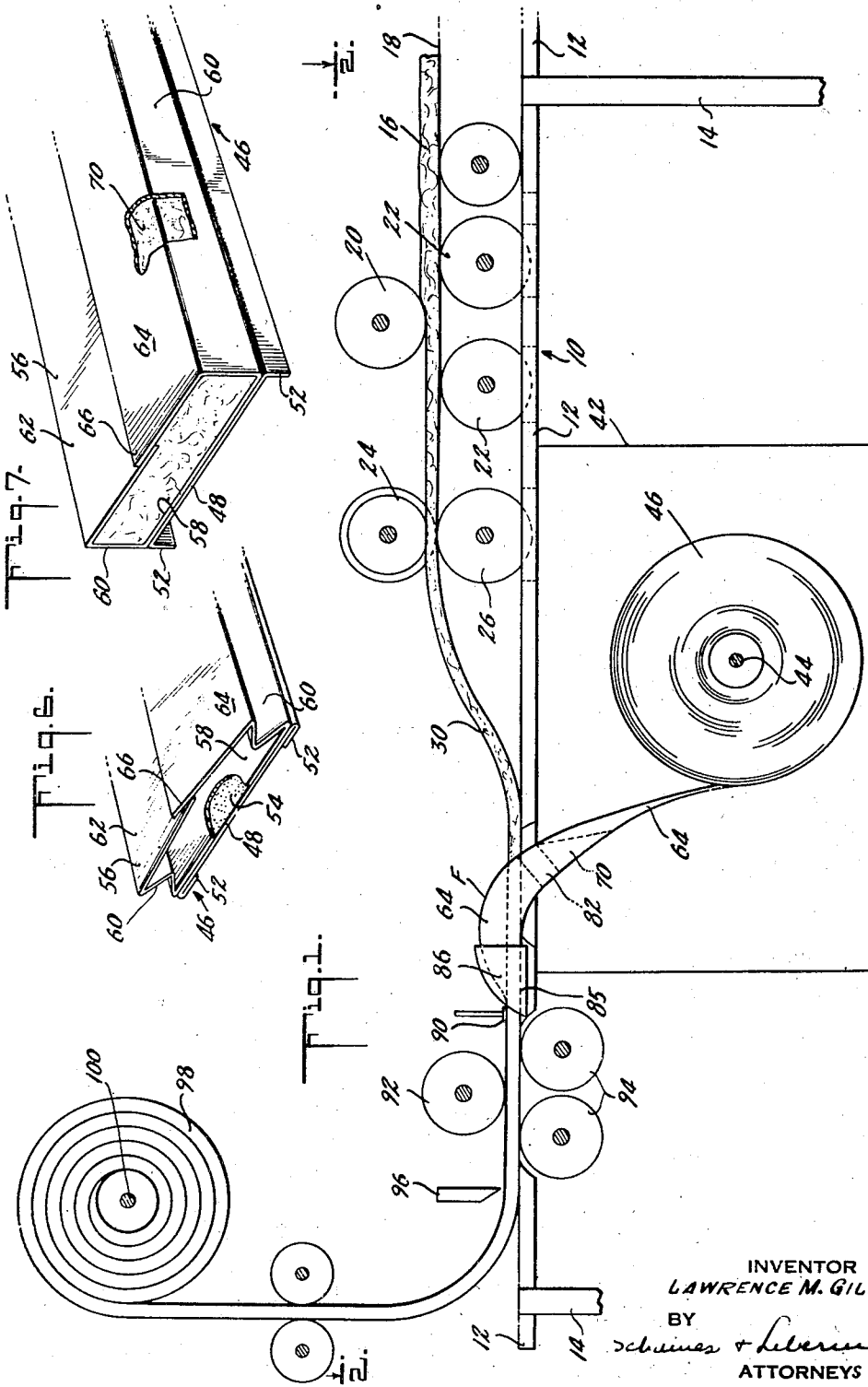
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2,435,347

BLANKET INSULATION AND METHOD OF AND APPARATUS FOR FORMING THE SAME

Filed March 13, 1946

3 Sheets-Sheet 1



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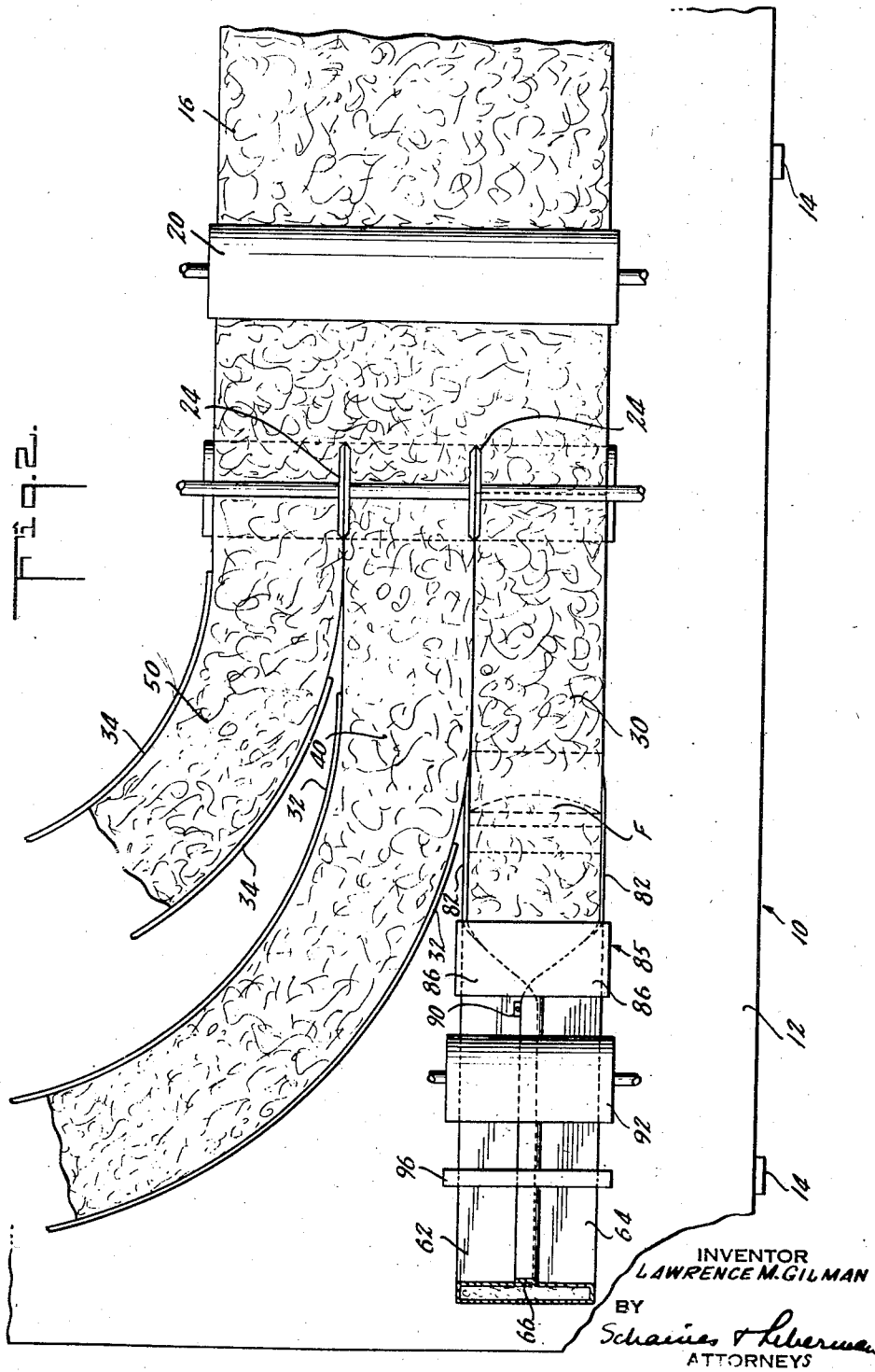
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Fig. 5.

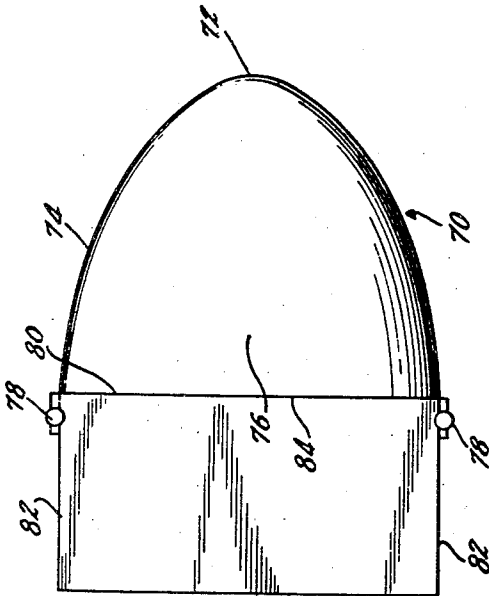
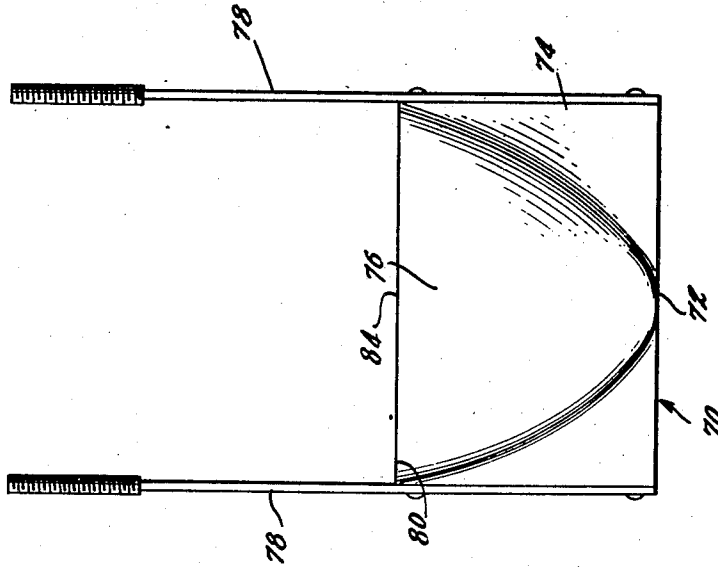


Fig. 3.

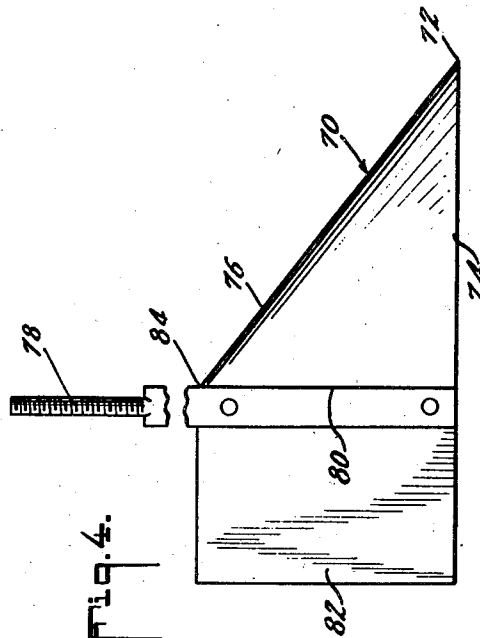


Fig. 4.

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BLANKET INSULATION AND METHOD OF
AND APPARATUS FOR FORMING THE
SAME

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7 Claims. (Cl. 154—27)

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My invention relates generally to insulation blankets, and in particular it relates to insulation of the envelope type and a novel method of and apparatus for forming the same.

The main object of my invention is the provision of a new and different kind of blanket insulation, and the provision of a novel method of and apparatus for manufacturing the same in a continuous operation. Insulation blankets, wrapper-enclosed, have been made in the past, but these have never been made in a continuous operation nor have they been enclosed in wrappers similar to mine. Conventionally, it is known to be old to form a continuous sheet of batting of insulating material and then to enclose same in an enveloping sheath, but never before has this been done in a continuous operation wherein, as in my invention, the wrapper or sheath material is preformed as a unitary elongated flattened tube, automatically opened to receive the batt, and then closed over the batt, and the wrapper thereafter sealed around the batt, and either cut into desired lengths or removed onto a take-up spool.

Another object of my invention is the provision of an apparatus for automatically and continuously opening an elongated, flattened tubular envelope or sheath, depositing a continuous batt length therewithin, automatically sealing the envelope or sheath about the batt, and thereafter removing the sheathed or enveloped batt.

Other objects, as structural details of portions of my apparatus, and specific steps in my method, the specific nature and structure of the wrapper, etc., will be obvious from the following description of an illustrative embodiment of my invention, and will be specifically pointed out in the following description thereof.

In the drawings annexed hereto, forming a part hereof,

Figure 1 is a side elevational diagrammatic view of one form of apparatus constructed according to and embodying my invention, illustrating the various steps in my novel method;

Figure 2 is a top plan diagrammatic view of the apparatus illustrated in Fig. 1, taken along the line 2—2 of Fig. 1;

Figures 3, 4 and 5 are, respectively, a top plan view, a side elevational view and an end elevational view of the spreader shoe component of my apparatus;

Figure 6 is a perspective view of the empty flattened tubular envelope-sheath component of my invention, partially expanded, with a portion broken away to show the securement of the envelope to the backing member; and

Figure 7 is a perspective view of the expanded and insulation-filled envelope-sheath, partly broken away.

Referring now to the drawings, and particularly 60

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Figs. 1 and 2 thereof, my apparatus is indicated generally by reference numeral 10, and comprises a wide, flat, elongated and horizontally extending platform 12, supported in spaced relation to the floor as by uprights 14, 14. The batt of insulating material (which may be of cotton, ligno-cellulosic fibrous material, rock wool, or of any other suitable or desired material) is designated by reference numeral 16, and may be formed by conventional means (not shown) either in the form of strips of predetermined length, or as a continuous ribbon, as shown, carried by an endless conveyor belt 18 onto one end of platform 12, and between a battery of power driven compression rollers 20, 22, mounted above platform 12, to compress the batt 16, originally formed of uneven thickness, to uniform thickness between the several rollers of the battery, and to advance same along the platform.

Batt 16 may be formed in a wide strip measuring 72" across, and may be slit into 18" wide or 24" wide strips, or into strips of any desired width, for insertion into an enclosing envelope-sheath, the 18" and 24" widths being more or less conventional sizes.

In Fig. 2, I show my 72" batt, after compression by the power-driven squeeze rollers 20, 22, being moved between two pairs of opposed slitting rollers 24, 26, and severed thereby into three strips 30, 40, 50, of equal 24" width. After the slitting, the three strips 30, 40, 50 may be guided, as by suitable channels 32, 34 in any desired direction. I will describe and illustrate my invention in respect of but one strip, as 30, it being understood that the other strips 40, 50, may be similarly treated by similar apparatus, only that method and apparatus operating on the one strip 30 being shown and described herein.

Below platform 12, I dispose a casing 42, within which, on a horizontal shaft 44, I dispose a roll or magazine of preformed envelope-sheath material 46, which comprises a backing sheet 48 (of paper, textile material, or combination thereof) the sides of which are bent over to form flanges 52, 52 by which the material may be secured to studs or rafters (not shown). On the side of backing sheet 48 opposite the bent-over flanges 52, 52, I deposit a continuous layer, or striations, of a suitable adhesive material 54 and thereby secure thereto the envelope-sheath 56 itself, which comprises an elongated sheet of suitable material as paper, impregnated paper, textile material or the like having a base portion 58, pleated side wall portions 60 and top flaps 62, 64. These top flaps 62, 64, as shown in Figs. 2, 6 and 7, are of unequal widths, one flap 62 being substantially half the width of base 58 and the other flap 64 being slightly wider than flap 62, so as to overlap same slightly, as shown at 66 (see Figs. 6 and 7).

The roll or magazine of the flattened tubular

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envelope 46, mounted on shaft 44 in casing 42, is empty of any filter, and is more collapsed than as shown in Fig. 6, with pleated side walls, 60, 60 folded inwardly, and the top flap 62, 64 lying flatly against the bottom 58. As the envelope 46 is drawn upwardly, it is led into engagement with an expanding shoe 70 mounted on platform 12 and downwardly angled therefrom as shown in Fig. 1. Shoe 70 may be formed of metal, wood or any other rigid material, and comprises a tapered and flattened leading nose portion 72, flaring gradually to widened sides 74 and tapering upwardly to a crown 76. Shoe 70 may be supported immediately below platform 12 as by straps 78, 78 and may be adjustable in height. The curved upper surface 80 of shoe 70 may be continuous or perforate, the desiderate being a device with a thin tip end as 72 to fit into the space between the bottom 58 and the sides and the top flaps 62, 64 to flare the sheath and spread apart and raise the side walls and flaps 62, 64 to extend at right angles to bottom 58. Shoe 70 is so disposed that its rear 80 is immediately below the level of platform 12 and just past the point where strip 30 is moved onto the platform from the battery of slitting rollers 24, 26 (see Fig. 1). A pair of vertically upstanding wall members 82, 82 are provided and secured to the rear of shoe 70 to keep the top flaps 62, 64 in the right angle position with respect to the bottom portion 58. In this manner, and by means of the spreader shoe 70 and the walls 82, the empty and collapsed envelope-sheath 46 is opened in U-form, so that at the point F (Fig. 2) where batt strip 30 is led onto platform 12, it rides over the top portion 84 of shoe 70 and between walls 82, 82 where it is deposited onto the bottom portion 58 of the now-expanded envelope material 46.

The envelope-sheath 46, batt-strip 30 filled at this point, is then led through a tube or tunnel having progressively inwardly and downwardly curving and converging side-walls 86, 86, causing the flaps 62, 64 on the moving sheath 46 to be bent over and down onto batt-strip 30, into the position shown in Fig. 7.

A suitable mechanism may be provided and disposed near the exit from tube or tunnel 86 to glue the overlapping flap portions, one form consisting of a shoe 90 extending laterally between the flap overlaps and having a constant feed of adhesive material to be deposited on the overlapping surfaces.

The enveloped batt strip is then led between a battery of power-driven pressure and squeeze rollers 92, 94 which press the overlapping flaps together to complete the sealing of the batt within the expanded sheath 46.

A suitable cut-off mechanism, as 96, may be provided and mounted behind rollers 92, 94 to divide the enveloped strip into suitable lengths, or, if desired, the strip may be wound up onto a take-up roll, as 98, for storage or convenience in shipping. Shaft 100, on which roll 98 is disposed, may be power driven. In casing 42, the collapsed envelope is drawn off shaft 44 by battery 92, 94 while the power driven take-up shaft 100 winds up the filled and sealed envelope, ready for attachment to wall, roof, ceiling or floor structures.

It is obvious that with my novel method and apparatus, I am enabled to continuously form a new type of insulation blanket which is completely enclosed and sealed within a sheath; that in my insulation blanket there is only one sealing

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operation to be performed; that in my blanket there is only a single line of joint for the enclosure throughout the entire length thereof; that the various steps can be performed continuously and smoothly; that the steps of opening the collapsed envelope-sheath, depositing the batt therein, closing the envelope flaps over the batt and sealing same are carried out evenly, smoothly and sequentially and without stopping the apparatus.

It will be obvious that additional casings 42, shoes 70, tunnels 86, etc., may be provided to operate on strips 40, 60, and it is equally plain that the strips may be made as wide or as narrow as desired, all within the scope of my invention. My new blanket construction comprises a backer having means thereto whereby the blanket may be secured to a building structure, an envelope secured thereto, insulating material disposed and sealed within the envelope with the line of joint of the envelope extending longitudinally and centrally of the blanket on the side thereof remote from the backer.

Having now described my invention what I claim and desire to secure by Letters Patent is:

1. An apparatus for opening and filling an elongated envelope wrapping with blanket insulating material, which envelope consists of an elongated sheet of material having a central portion, a pair of side portions, and a pair of top flap portions, each of which flaps is substantially half the width of the central portion, one of the flaps being wider than the other and adapted to overlap same, the apparatus comprising conveying means to move the envelope sheet at a constant speed laterally, means to spread the side walls and flaps of the moving sheet to expose the central portion thereof to permit access to the top of the central portion, conveying means to move an elongated strip of insulating material at the same speed as the envelope sheet, and means to deposit same on the exposed central portion, means to fold the flaps over and on top of the strip with the flap edges overlapping, and means to secure the overlapped edges together.

2. An apparatus for continuously forming completely enveloped insulation blanketing, the enveloping material prior to insertion of the insulation comprising an elongated sheet of material having a base portion, a pair of side wall portions, and a pair of top flap portions, each of which flaps is substantially half the width of the base, one of the flaps being wider than the other and adapted to overlap said other, the apparatus comprising roller means to draw the empty and collapsed envelope continuously at a constant rate of speed, flaring shoe means to open the envelope to permit access to the base, roller means to move a strip of insulating material continuously and at the same rate of speed as the envelope, the flared sides of the enveloping material guiding the moving strip of insulation onto the moving base of the envelope, means to fold the top flaps over and on top of the strip, with the flaps overlapping, and means to secure the overlapped flaps.

3. Apparatus as in claim 2, in which the envelope opening and flap closing means are stationary, and the opening and closing is effected by movement of the envelope with respect thereto.

4. The method of forming a blanket of insulating material which comprises the steps of forming an elongated empty envelope, flaring the envelope to permit access to the interior thereof,

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depositing a batt of insulating material inside the flared envelope, and thereafter folding the envelope over the batt and sealing same.

5. An apparatus as in claim 1, in which the spreading means comprises a shoe member, the rear of which is substantially as wide as the central portion of the envelope sheet, the shoe tapering forwardly and downwardly towards the narrow leading front edge thereof.

6. An apparatus as in claim 1, in which the flap folding means comprises a hollow tunnel member having a flat floor portion, and an arched dome portion, the dome being sufficiently high at one end thereof to receive thereunder the spread top and side walls of the sheet, the height of said dome tapering downwardly and rearwardly towards the other end, spaced from the floor sufficiently to permit the blanket filled envelope to pass therethrough.

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7. The method as in claim 4, in which the envelope is moved in the direction of its length during flaring thereof, and the batt is moved in the same direction while it is deposited within the envelope.

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