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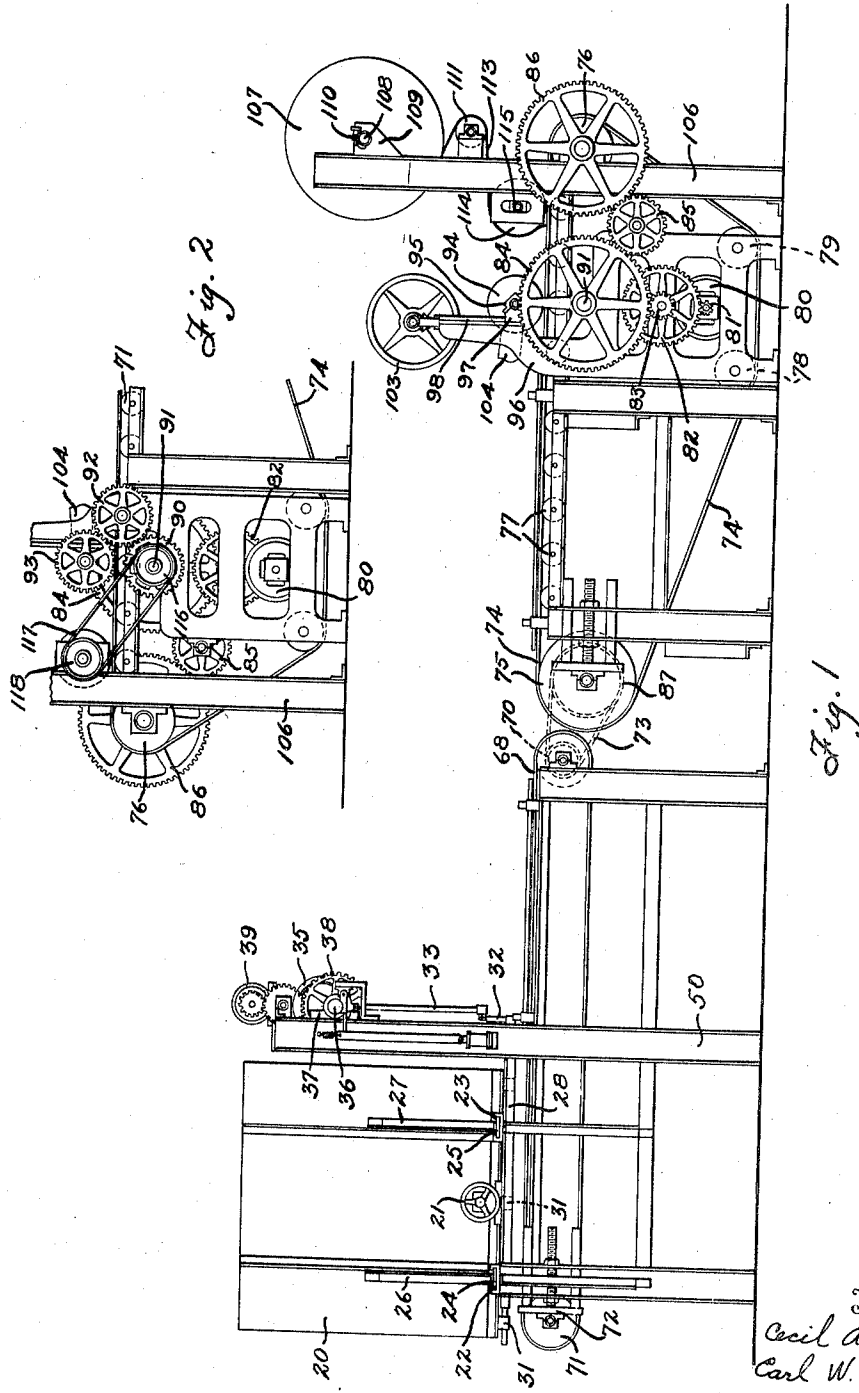
C. A. MANN ET AL

2,216,276

CONVEYER LOADING DEVICE

Original Filed April 30, 1932

4 Sheets-Sheet 1



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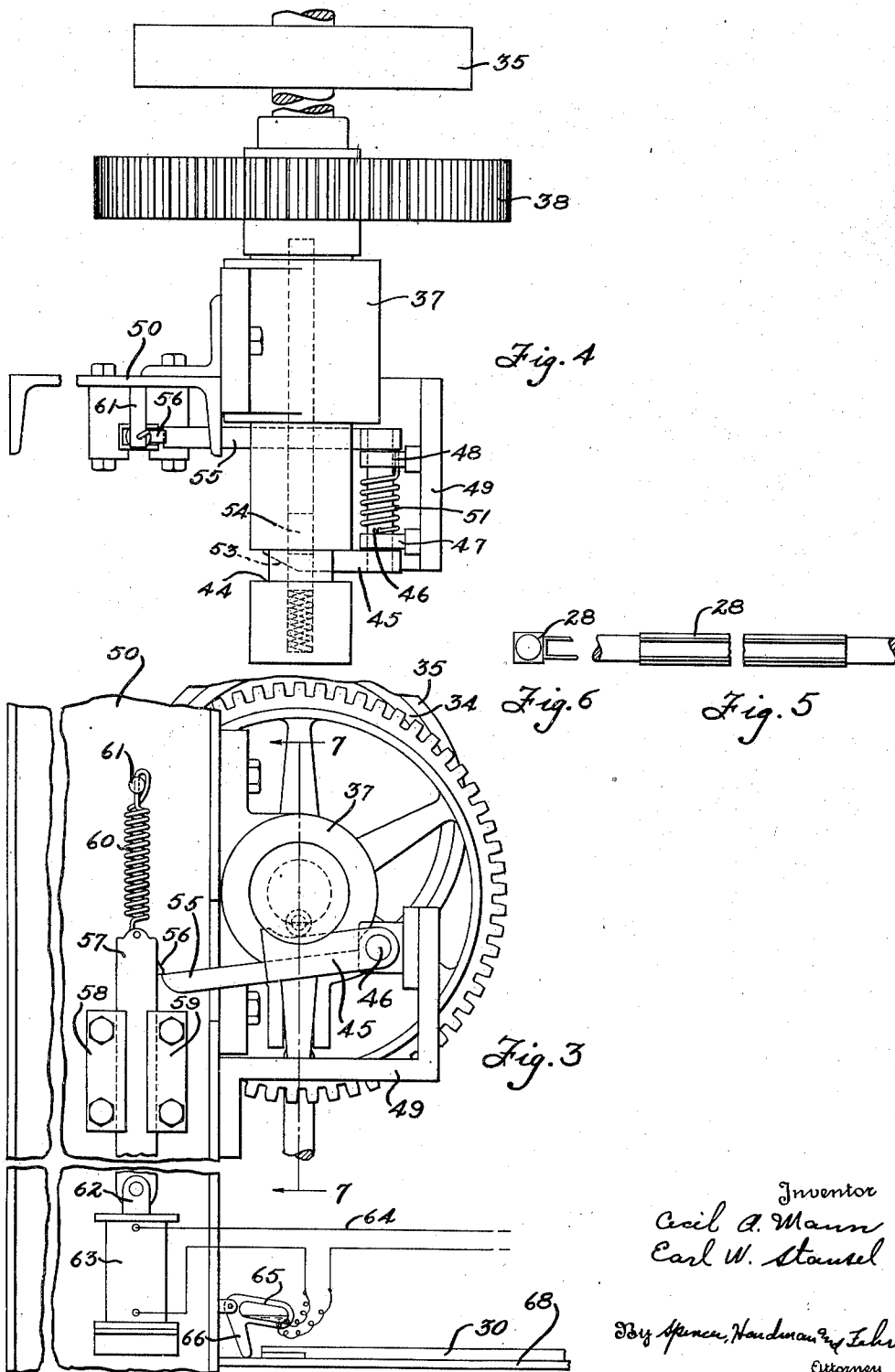
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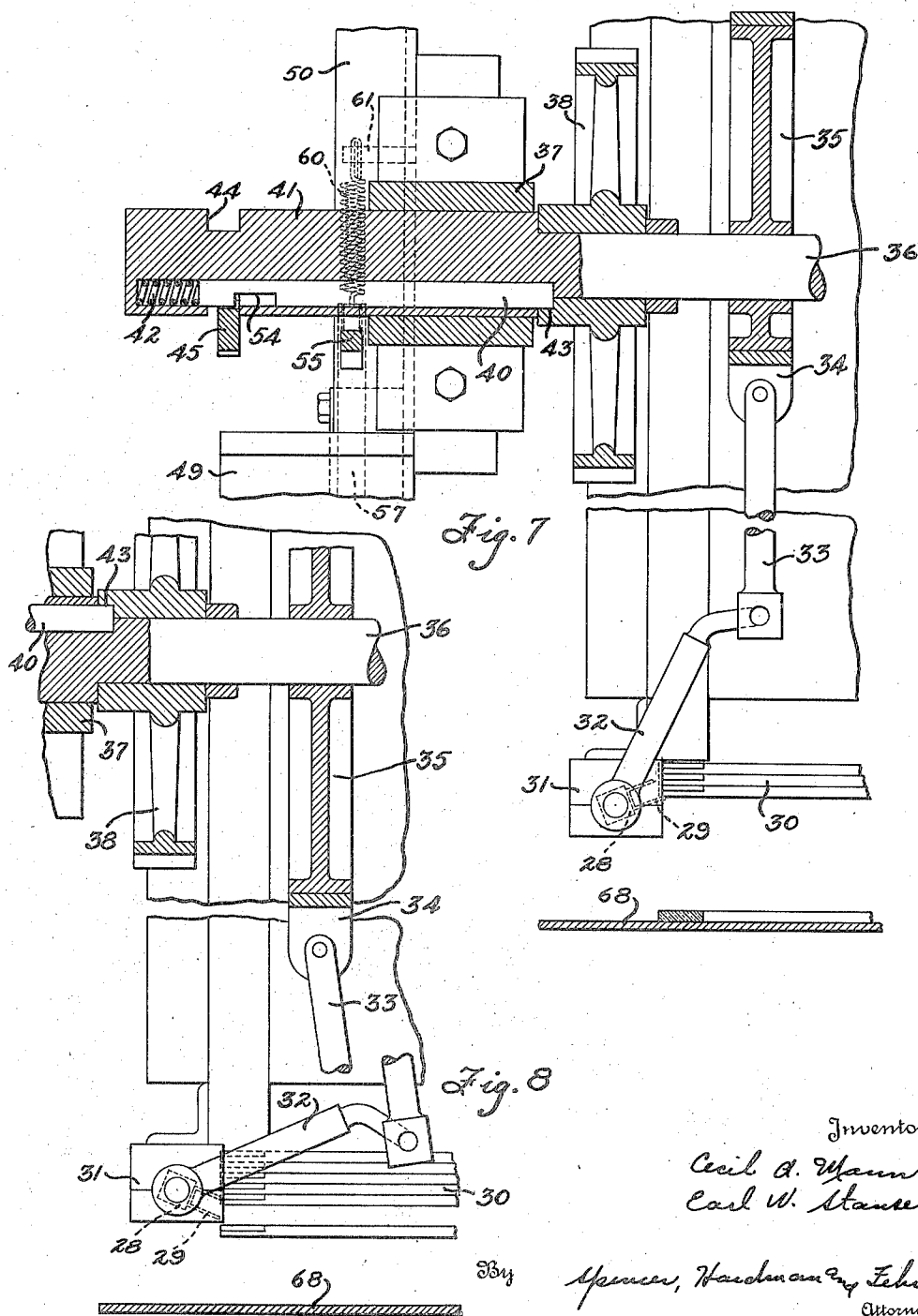
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4 Sheets-Sheet 3



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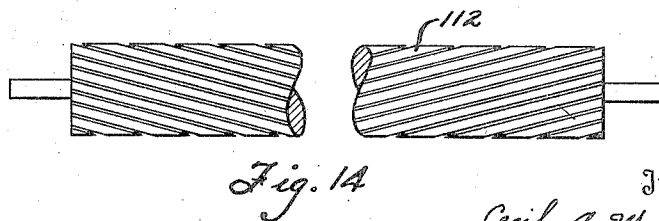
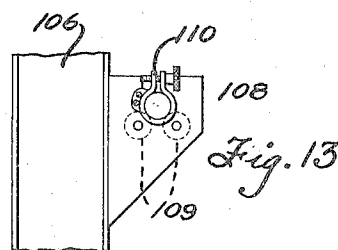
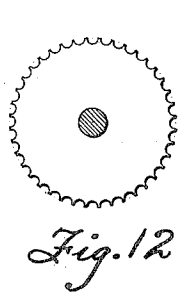
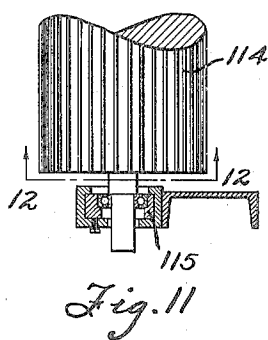
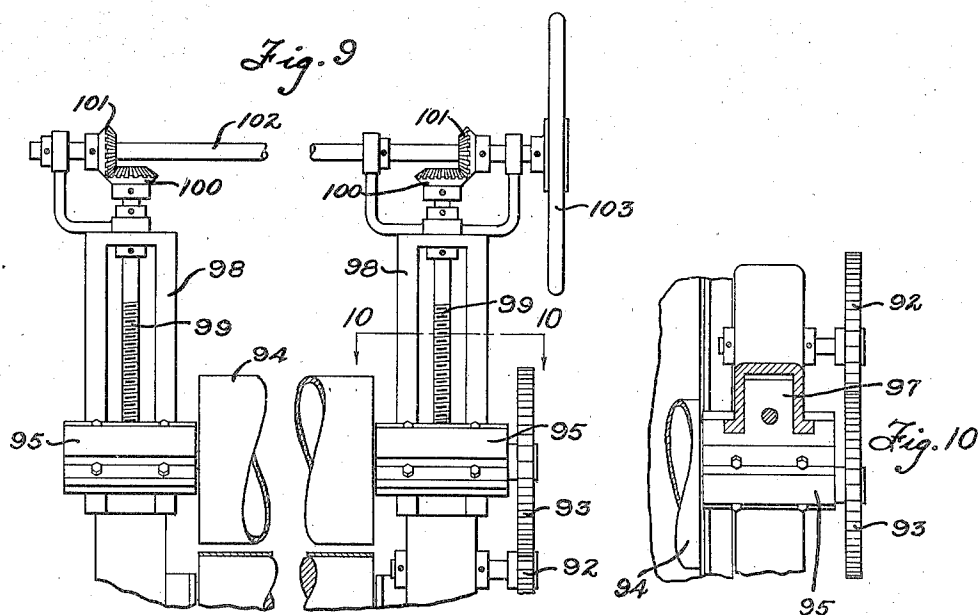
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CONVEYER LOADING DEVICE

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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CONVEYER LOADING DEVICE

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Original application April 30, 1932, Serial No.
608,552. Divided and this application June 19,
1937, Serial No. 149,189

5 Claims. (Cl. 214—8.5)

This invention relates in a general way to re-
frigerating apparatus and more particularly to a
method and a machine for applying sheet mate-
rial to objects, such as the applying of bright met-
5 tallic foil to rectangular frames which are to be
assembled and placed between the inner and out-
er walls of a refrigerator cabinet to serve as an
insulating medium.

This application is a division of our copending
10 application, Serial No. 608,552, filed April 30, 1932.

Recent investigations have disclosed that a plu-
rality of dead air spaces of a relatively narrow
width separated by sheets of bright metallic foil
such as bright aluminum foil provide an insu-
15 lation which is superior in its insulating prop-
erties to practically all of the commercial insulat-
ing materials now being used for refrigerator
cabinets. In fact this type of insulation has been
found to be most highly efficient over a very great
20 range of temperature for a variety of situations.
This foil insulation has many advantages includ-
ing light weight and low cost of material. It was
found that the most practical construction was to
provide a plurality of rectangular frames of a
25 thickness of about $\frac{1}{2}$ " upon which a sheet of foil
was applied. A plurality of these frames are then
stacked and fastened together to form an insu-
lating panel which is then inserted between the
inner and outer walls of a refrigerator cabinet or
30 structure which it is desired to insulate.

It is to this type of insulated refrigerator cabi-
net to which our invention relates and has for
its objects the provision of an improved method
for applying the sheet material to the frames and
35 apparatus for carrying out such improved meth-
od.

Further objects and advantages of the present
invention will be apparent from the following de-
scription, reference being had to the accompany-
40 ing drawings, wherein a preferred form of the
present invention is clearly shown.

In the drawings:

Fig. 1 is a view in elevation of our machine for
45 carrying out our improved method;

Fig. 2 is a view of a portion of the opposite
side of the machine;

Fig. 3 is a fragmentary view in elevation of a
portion of the automatic feeding mechanism;

50 Fig. 4 is a plan view of an upper portion of the
automatic feeding mechanism;

Fig. 5 is a side view of the forked feed control-
ling rod;

Fig. 6 is an end view of the forked feed con-
55 trolling rod;

Fig. 7 is a fragmentary view partly in section
showing the front of the feeding mechanism;

Fig. 8 is a somewhat similar fragmentary view
partly in section of the front of the feeding me-
chanism showing the feeding mechanism releasing
one of the frames;

Fig. 9 is a fragmentary view of a means for ap-
plying an adhesive to the frame;

Fig. 10 is a sectional view along the line 10—10
of Fig. 9;

Fig. 11 is a fragmentary top view of the roll
member for applying the foil to the frames to-
gether with one of its bearings;

Fig. 12 is a sectional view along the line 12—12
of Fig. 11;

Fig. 13 is a fragmentary view showing the ten-
sioning means for the foil;

Fig. 14 is a view in elevation of a grooved cy-
lindrical member for straightening out the foil;
and

Fig. 15 is an end view of the cylindrical member
shown in Fig. 14.

The present invention is directed to a machine
having a hopper and automatic means controlled
by the frames which have been released from the
feeding means for releasing the frames from the
hopper and placing them on a conveying means
which is so driven as to place these frames in end
to end relation upon a second conveying means
which carries the frames beneath a roll for ap-
30 plying an adhesive to the frames and thence con-
tinues and carries the frames beneath a second
roll which applies a continuous sheet of bright
metallic foil to the successive frames as they
pass under the applying roll.

Referring to the drawings and more particular-
ly to Fig. 1, there is shown a hopper 20, the walls
of which are movable by means of a suitable con-
trolling means shown as a hand control wheel 21.
The hand control wheel 21 moves the walls of
the hopper 20 so as to change the inner dimen-
sions thereof. The sides of the hopper 20 are
mounted upon a pair of slideways 22 and 23. The
slideways 22 and 23 are provided with a pair of
slides 24 and 25 which support the side walls of
45 the hopper. The side walls are braced by suitable
angle braces 26 and 27. Beneath the hopper at
either side there is supported a forked control rod
28, one of which is shown in detail in Figs. 5
and 6.

Referring now more particularly to Fig. 7 which
shows only one side of the automatic dropping
mechanism, the forked control rod 28 is shown
having its lower laterally extending prong 29 sup-
55 porting a plurality of frames 30. Each of the

control rods 28 are supported by suitable bearings such as a bearing 31. At the front end of each of the control rods 28 there is connected a control arm 32. This control arm 32 is connected by means of a link 33 to the follower 34 of an eccentric 35 which is fixed to the rotatable control shaft 36. At either end the control shaft 36 is provided with suitable bearings 37. For the purpose of driving the control shaft 36 and the eccentric 35, there is provided a gear 38 which is rotatably mounted on the control shaft 36. The gear 38 is driven at a relatively slow speed by an electric motor 39 shown in Fig. 1.

A pin type clutch mechanism having a clutch pin 40 is provided for connecting the driving gear 38 with the shaft 36 at suitable times. The clutch pin 40 is slidably mounted within the enlarged end portion 41 of the control shaft 36 and is normally pressed by a coil spring 42 into engagement with a notch 43 in the hub for connecting the driving gear 38 with the control shaft 36. Near the end of the enlarged end portion 41 of the control shaft 36 there is provided an annular control groove 44 which is adapted to receive a clutch finger 45 which is fixed to the end of the clutch finger shaft 46 which is rotatably mounted in a pair of bearings 47 and 48 supported by a bracket 49 which is connected to the upright channel frame member 50. A suitable torsion coil spring 51, having one end connected to the clutch finger shaft 46 and the other end connected to the bearing 48, is provided for holding the clutch finger 45 up in the groove 44. The clutch finger 45 is provided with a tapered front end portion 53 which is adapted to engage and cam outwardly the wall of a notch 54 provided in the portion of the clutch pin 40 exposed by the annular control groove 44.

In order to remove the clutch finger 45 from the annular control groove 44 and to release it from engagement with the notch 54 so as to permit the inner end of the clutch pin 40 to engage its driving notch 43 in the driving gear 38, there is fixed to the other end of the clutch finger shaft 46, a control arm 55 which is adapted to be engaged by the spring pressed latch 56 upon a control link 57 which is vertically slidable in the guideways 58 and 59 attached to one of the upright channel frame members 50. The control link 57 is normally held in its upper most position by means of a tension coil spring 60 which has its lower end connected to the control link 57 and its upper end connected to a pin 61 which is fastened to the upright channel frame member 50. The lower end of the control link 57 is connected to the movable armature 62 of a solenoid 63.

The solenoid 63 is adapted to be supplied with electric energy through a suitable electric circuit 64 having a control switch 65 of the mercury tube type which has an arm 66 adapted to ride upon an edge at each of the frames as they are carried from the automatic feeding mechanism by the conveyor belt 68. When the arm 66 of the mercury tube control switch rides upon the edge of one of the frames 30, the mercury tube switch 65 is tilted so that the mercury flows to the opposite end of the tube from which the separated contacts are fixed and opens the electrical circuit 64, causing the solenoid 63 to be de-energized. When one of the frames 30 is carried on by the conveyor belt, the arm 66 drops to the upper surface of the conveyor belt 68 and causes the mercury to flow to the opposite end of the

mercury tube to complete the electric circuit and permit electric energy to flow to the solenoid 63. The application of electric energy to the solenoid 63 causes the armature 62 to be drawn downwardly, thereby pulling the control link 57 downwardly against the tension of the spring 60 and also drawing the clutch finger control arm 55 downwardly by means of the spring pressed latch 56. The drawing downwardly of the clutch finger control arm 55 removes the clutch finger 45 from the clutch control groove 44, thereby releasing the clutch finger 45 from the notch 54 in the clutch pin 40 to cause the clutch pin 40 to connect the driving gear 38 with the control shaft 36.

Inasmuch as the driving gear 38 is driven at all times by the electric motor 39, the control shaft 36 and the eccentric 35 will be caused to rotate, thereby moving the link 33 downwardly, causing the control rod arm 32, and consequently the forked control rod 28, to be moved in a clockwise direction to release one of the frames 30 from the quantity in the hopper 29 and to permit it to fall on the upper surface of the conveyor belt 68. The operation of the control shaft 36 is limited to one revolution at a time since after the downward stroke of the control link 57, the clutch finger control arm 55 becomes disengaged from the spring pressed latch 56, thereby permitting the torsion spring 51 to return the clutch finger 45 to its normal position in the clutch control groove 44 to cause it to engage the notch 54 in the clutch pin 40 to release the pin 40 from its connection with the driving gear 38. The driving gear 38 will then rotate freely upon the control shaft 36. After the forked control rod 28 has released one of the frames 30 from the quantity in the hopper, it is quickly drawn upwardly again but the continued rotation of the eccentric 35 through the remainder of the single turn permitted by the release of the clutch finger 45. In this way the lower prong 29 returns to its normal upper position with sufficient rapidity to prevent more than one of the frames 30 to be released at a time.

The frames 30 which are placed on the conveyor belt 68 at spaced intervals by the automatic dropping mechanism are carried to the foil applying portion of the machine. The conveyor belt 68 is preferably of the endless type and is supported at either end of the feeding portion of the machine by the pulleys 70 and 71. The pulley 71 is supported by adjustable bearing 72 to properly tension the conveyor belt 68. The pulley 70 is driven at a comparatively rapid rate by the belt 73.

As stated before, the conveyor belt 68 feeds the frames 30 to a second conveyor belt 74 upon the foil applying portion of the machine. The conveyor belt 74 is driven at a slower rate of speed than the belt 68 so as to cause the belt 68 to push the frame into end to end relation upon the belt 74. The ratio of the rates of speed of the belts 68 and 74 is approximately two to one. The conveyor belt 74 is supported by pulleys 75 and 76 and opposite ends of the foil applying portion of the machine as well as by idler rollers 77 between the pulleys 75 and 76 and by idler pulleys 78 and 79 beneath. The conveyor belt 74 is driven by the electric motor 80 through a series of reduction gears 81, 82, 83 and 84 as well as the gears 85 and 86 which finally drive the pulley 76. The pulley 75 at the opposite end of the foil applying portion of the machine is provided with a pulley 87 for driving the belt 73.

At the opposite side of the foil applying portion of the machine shown in Fig. 2, there is a gear 90 fixed to the opposite end of the shaft 91 upon which the large gear 84 is fixed. The gear 90 through the medium of an idler gear 92 drives a gear 93 of equal size fixed to the opposite end of a gluing or adhesive applying roll 94 which is rotatably mounted in a pair of bearings 95, better shown in Fig. 9, which are supported by a pair of slides 97 which are slidably mounted in vertical slideways 98 in the upper portion of the case frame 96. The slides 97 are adapted to be raised or lowered as desired, by the threaded shafts 99 which are provided with miter gears 100 at their upper ends which engage similar miter gears 101 mounted upon the shaft 102 provided with a hand wheel 103 at one end for raising or lowering the gluing roll 94 to accommodate different thicknesses of foil frames. The gluing roll 94 is provided with a gluing pot 104 at its opposite side which is adapted to be filled with an adhesive substance such as glue or hot asphalt. The gluing pot 104 is preferably provided with an electric heater or a steam coil for heating the glue or asphalt. The gluing pot 104 keeps the gluing roll 94 covered with a film of glue or hot asphalt so that when the foil frames are carried beneath the gluing roll 94 by the conveyer belt 74, the gluing roll 94 rolls the film of glue or hot asphalt on to the upper surface of each of the frames. The drive gearing is so proportioned that the peripheral space of the gluing roll 94 is substantially equal to the linear speed of the belt 74. This provides the upper surface of each of the foil frames with an adhesive of a suitable thickness.

After passing beneath the gluing roll 94, the foil frames pass to the foil applying means. The foil applying means are supported upon an upright channel frame 106. At the upper end of one member of this upright frame 106, there is provided a roll 107 containing a roll of bright metallic foil such as bright aluminum foil. This roll 107 is provided with a shaft 108 which rotates therewith and which is rotatably mounted by being supported by a pair of anti-friction rollers. The outer end of the shaft 108 is provided with an adjustable brake means 110 which serves as a tension means. The foil from the roll 107 is passed around a stationary spreading roll 111, better shown in Figs. 14 and 15, which is provided with grooves 112 for spreading a sheet of foil coming from the roll 107. From the spreading roll 111, the sheet of foil 113 is passed around the foil applying roll 114 in its direction of rotation. The foil applying roll 114 is rotatably mounted in bearings 115 and driven by a pulley 116 mounted on the shaft 91 which derives a belt 117 which in turn drives a pulley 118 mounted on the shaft of the foil applying roll 114. Inasmuch as the pulleys 116 and 118 are of equal size the foil applying roll 114 is driven at the same speed as the gluing roll 94. The foil applying roll is finely fluted or grooved so as to prevent slipping of the foil upon the roll as it is being applied. The gluing roll 94 and the foil applying roll 114 are preferably of the same diameter and the gears are preferably so proportioned that the peripheral speed of each of these rolls is substantially equal to the speed of the conveyer belt 74 as suggested before. The foil applying roll 114 is supported by its adjustable bearing 115 at such a height above the conveyer belt 74 that it will cause the foil 113 to be rolled on to the successive foil frames passing beneath

the foil applying roll with the proper pressure. In this way the foil is rolled on to the succession of foil frames which pass therebeneath as a continuous strip. After the foil is applied to the frames, the foil between the frames is severed and the foil frames are stacked together to form an insulation panel.

By our improved method of rolling the adhesive and the foil on to the foil frames, we have made it practical to use the so-called foil insulation for various insulating purposes such as for refrigerator cabinets. Our improved machine disclosed herein is adapted to carry out our improved method to great advantage.

While not shown on the drawings, we prefer to use a conventional clutch means between the gear 86 and the roll 76, the clutch means being provided with manual means for the operation thereof. By the use of such a clutch, should the machine jamb, the roll 76 may be declutched to stop the movement of the belt 74 and the feeding means while at the same time permitting the electric motor 80 to continue to drive the gluing roll 94. It is desirable to keep the gluing roll 94 rotating to prevent the glue from dripping onto the belt 74.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A machine for placing objects in edge to edge relation upon a conveying means, said machine itself including an endless conveyer belt distinct from said above mentioned conveying means, said belt being driven in the same direction as said conveying means, said belt and conveying means being substantially in alignment, means controlled by the objects previously placed upon the belt for placing the objects one by one upon the belt from a source of supply, and means for driving the belt at a greater speed than the conveying means for placing the objects in edge to edge relation upon the conveying means.

2. A machine for placing objects upon a conveying means comprising a source of supply of said objects, means for discharging the objects one by one upon the conveying means, a power means for operating said discharging means, a clutch means for controlling the application of said power means to said discharging means, said clutch means being provided with an electromagnetic control means, and a switch means controlled by objects previously discharged upon said conveying means for controlling the energization of said electromagnetic control means.

3. A machine including a conveying means, means for supporting a plurality of objects in the form of a stack directly above the conveying means, means for discharging the objects from the bottom of the stack directly upon the conveying means, and means responsive to the object previously discharged upon the conveying means for controlling said discharging means.

4. A machine including a conveying means, means for supporting a plurality of objects in the form of a stack directly above the conveying means, means for discharging the objects from the bottom of the stack directly upon the conveying means, and means solely responsive to the carrying away of the last object previously discharged upon the conveying means for controlling said discharging means to release an object from the stack when the conveying means

has carried the previously discharged object a predetermined distance away from the stack.

- 5 5. A machine including a movable conveyer belt, means for supporting a plurality of objects in the form of a stack directly above the conveyer belt, power means for discharging the bottom object in the stack directly upon the conveyer belt, a clutch means for controlling the operation of said power means, electric operat-

ing means for said clutch means, and a switch means having an operating means located a predetermined distance from said stack and responsive to the location of an object previously discharged upon the conveying means for controlling the energization of said electric operating means. 5

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