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2,175,274

REFRIGERATED SEALER FOR WRAPPING MACHINES

Filed July 20, 1935

2 Sheets-Sheet 1

FIG. 1

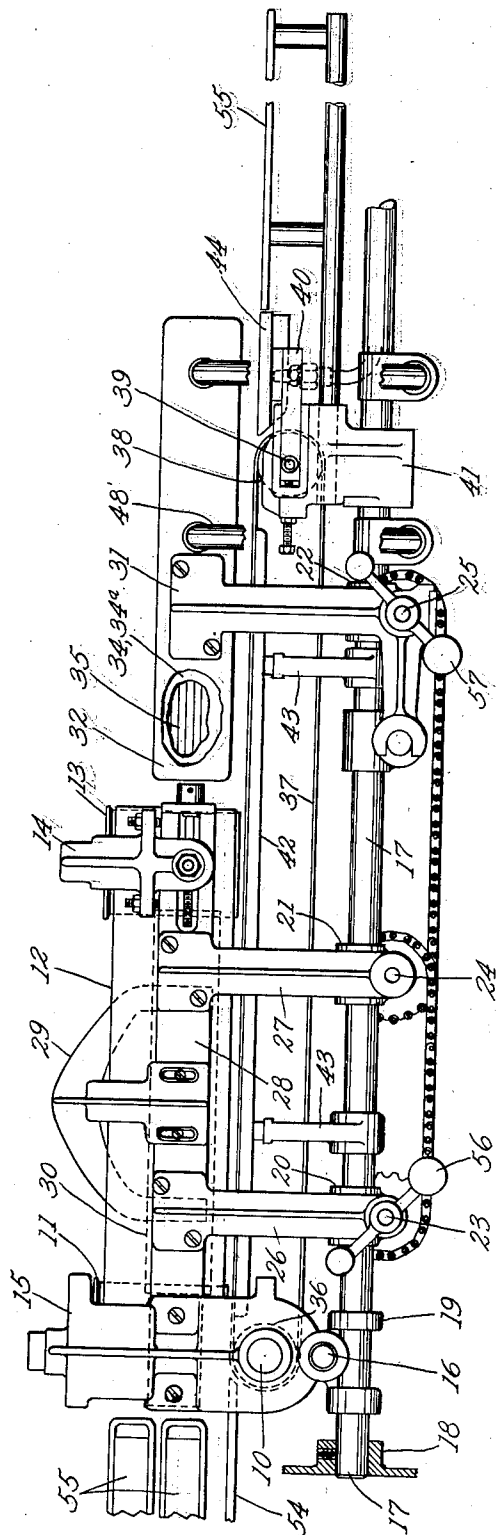
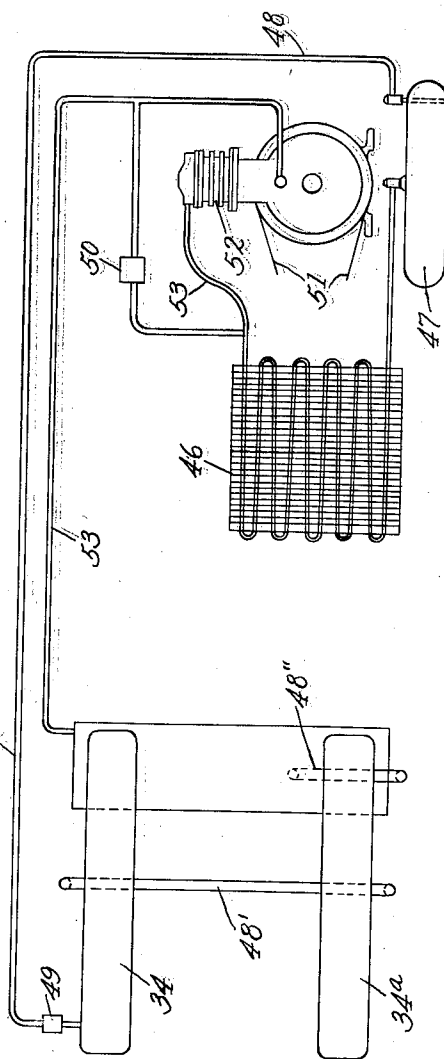


FIG. 2



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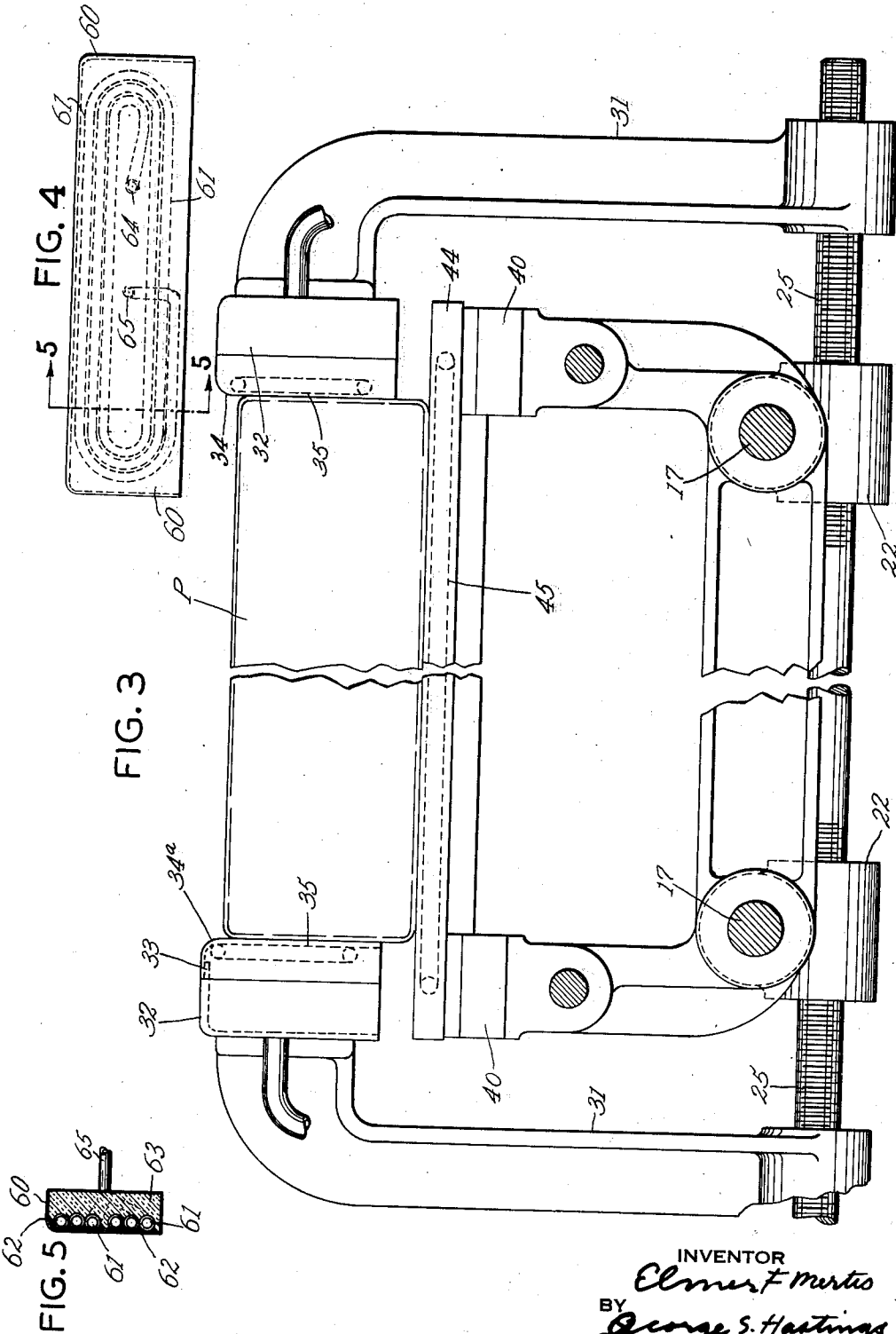
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REFRIGERATED SEALER FOR WRAPPING MACHINES

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5 Claims. (Cl. 93—2)

This invention relates to improvements in heat seal wrapping machines, more particularly to a refrigerated sealer for the same. The main object of the invention is to chill the heated seals of the packages by a refrigerated sealer comprising cooling vessels having direct contact therewith, to the end that the refrigerated belts heretofore used in wrapping machines of this type may be eliminated. For this purpose the cooling vessels may be arranged to directly engage the heat sealed end folds and bottom seam of the packages advanced thereto from the heat sealing means by any suitable mechanism such as traveling endless belts. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or like parts:

Fig. 1 is a partial side view of a wrapping machine wherein the packages are advanced from the heat sealing means by a delivery conveyor to the improved refrigerated sealer;

Fig. 2 is a schematic view showing the connections of the refrigerating unit to the bottom and side expansion chambers of the refrigerated sealer;

Fig. 3 is an end view of the refrigerated sealer on an enlarged scale showing the adjustable mounting thereof;

Fig. 4 is a front elevation of an expansion chamber construction suitable for the purpose of the present invention; and

Fig. 5 is a cross-section of the same.

In carrying the invention into effect there is provided a device for heat sealing packages, a set of cooling vessels arranged to directly engage and chill the heated seals of a package, means for maintaining said cooling vessels at a substantially constant temperature, and mechanism for receiving the heat sealed packages from said heat sealing means and advancing them to said cooling vessels, whereby the hot seals of the packages will be chilled. In the best constructions contemplated said means includes a thermostatically controlled refrigerating unit, and said cooling vessels, including a pair of adjustable side expansion chambers and a stationary bottom expansion chamber, the mechanism for advancing the packages being adjustable simultaneously with said side chambers and acting to

move the packages therebetween sidewise on to said bottom chamber. These various means and parts may be widely varied in construction, for the particular construction selected to illustrate the invention is but one of many possible concrete embodiments of the same. The invention, therefore, is not to be restricted to the specific arrangement shown and described.

Referring to the drawings, a shaft 10 suitably driven from the main drive of the wrapping machine drives, by means of bevel gearing (not shown), vertical shafts carrying the pulleys 11 which in turn drive the conveyor belts 12. These belts 12 also run over idler pulleys 13 which are supported in brackets 14. The housings 15, which support the pulleys 11, are slidably mounted on the shaft 10 and a cross-bar 16.

The tie-rods 17 are mounted at one end in bearings 18 of the machine frame and each carry a series of bearing blocks 19, 20, 21 and 22 which support the bar 16 and the spindles 23, 24 and 25, respectively. On each end of the spindles 23 and 24 are loosely mounted a set of arms 26 and 27 which are fastened to bars 28. At one end the bars 28 are fastened to the housing 15. A set of hooked brackets 29 adjustably mounted on the mid-section of the bars 28 overhang the belts 12 and carry tension bars 30 extending along the inner faces of the inner runs of the belts 12. The bars 30 thus act to reinforce the inner runs of the conveyor belts 12 and hold the freshly heat-sealed end folds of the package closed while they are advanced to the refrigerated sealer which will now be described. Referring to Fig. 3 of the drawings, the ends of the spindle 25 are oppositely threaded into the angle-bars 31 which are fastened to the plates 32, the free ends of the bars 31 engaging studs carried by collars fastened on the rods 17 whereby the bars 31 are maintained in an upright position. The plates 32 are provided with lugs 33 which carry the side cooling vessels of the refrigerated sealer which may be expansion chambers 34 and 34a as shown. The chambers 34 and 34a are equipped with expansion-coils 35.

The shaft 10, Fig. 1, carries a pulley 36 driving an endless belt 37 running over an idler pulley 38, and the pulley 38 is mounted on a shaft 39 journaled in the adjustable blocks 40 carried by brackets 41 fixed on the rods 17. In the space between the pulleys 36 and 38 is supported a table 42 attached to members 43 carried by the tie-rods 17. The bottom cooling vessel of the refrigerated sealer may be an expansion chamber 44 supported on the bars 40

and equipped with an expansion coil 45. However, it will be understood that the bottom and side cooling vessels may be tanks filled with brine in which the expansion coils are submerged.

Referring to Fig. 2 wherein is shown a refrigerating unit connected to the expansion coils of the tank 34, 34a and 44, the bottom coils of the condenser 46 and the receiver 47 thereof contain the condensed refrigerant. In the upper coils of the condenser the refrigerant is confined in a gaseous state under sufficient pressure to prevent the condensed refrigerant present in the lower coils and the receiver from boiling or vaporizing. The pressure thus exerted thereon forces the refrigerant up through the flexible tube 48 leading to the expansion coil 35 of the side chamber 34. A flexible tube 48' conducts the refrigerant from the outlet of the expansion coil in the chamber 34 to the inlet of the expansion coil 35 in the chamber 34a, and another flexible tube 48'' permits the refrigerant to flow from the expansion coil in the chamber 34a into the expansion coil 45 of the bottom chamber 44. The tube 48 at a point close to where it enters the tank 34 is equipped with an expansion valve 49 which regulates the flow of liquid and permits only a small stream of the refrigerant to flow into the expansion coil of the chamber 34, wherein it partially vaporizes and is further vaporized in the expansion coil of the chamber 34a and then completely vaporized in the expansion coil of the bottom chamber 44.

The vaporization of the refrigerant in this manner absorbs heat from the chambers 34, 34a and 44. A dual pressure control 50 of well known construction mounted in a pipe connected across the inlet and outlet of the compressor 52 controls the cutout circuit of a motor (not shown) to cause the motor, by means of a belt 51, to drive the compressor 52 and thereby pump the vaporized refrigerant out of the expansion coils of the cooling vessels and compress and return it through a conduit 53 to the condenser wherein it is condensed. Since the construction and operation of such dual pressure controls, to cause the compressor to maintain a constant supply of liquid refrigerant in the receiver, is well known, further description thereof is deemed unnecessary. A blast of air sent over the condenser coils by a fan driven from the motor shaft hastens this condensation. The expansion valve 49 is thermostatically controlled by a thermostat (not shown) mounted on the return line 53 and connected to the expansion valve to govern the flow of liquid refrigerant into the expansion coil of the chamber 34 in a well known manner to keep the expansion coils at a substantially constant temperature.

The packages P having been wrapped and the ends of the wrapper having been properly folded by suitable means (not shown), are pushed sideways across a bottom heat-sealing plate of conventional construction and between a set of side heater members 55 of well known type, which seal the bottom seam and end folds, respectively, of the packages. The packages, upon emerging from the sealing chamber, are advanced on to the conveyor belt 37 which carries them between the side conveyor belts 12 which thereupon coast therewith to propel the packages into the refrigerated sealer. The packages, on entering the refrigerated sealer, leave the conveyor belts 12 and are carried by the belt 37 past the side expansion chambers 34 and 34a thereof, whereby the heat-sealed end folds of the package are

chilled. The package is thus advanced on to the stationary bottom expansion chamber 44, where it remains until the succeeding package delivered by the conveyor belt 37 pushes it on to a take-off table 55. The bottom seam of the package is chilled and set while it rests on the bottom chamber 44. By turning the handles 56 or 57, which are mounted on the ends of spindles 23 and 25, respectively, the side conveyor belts 12 and the side expansion chambers 34 and 34a may be simultaneously adjusted to accommodate different lengths of packages.

The invention may be applied to wrapping machines of various types other than the bread wrapping machine chosen to illustrate one embodiment of the invention. Accordingly, the refrigerated sealer may be arranged to chill the heated seals of packages having various types of folds different from that shown herein.

In Figs. 4 and 5 is shown an expansion chamber, the construction of which is especially suitable for the bottom and side expansion chambers of the present invention. As illustrated therein, the expansion chamber includes a plate 60 adapted to engage the heated package seals, and an expansion coil 61 which is secured to the plate 60 by solder 62 and embedded in grooves of the base 63 which may be mounted on one of the bars 32 or on the bottom bars 40, the expansion coil having an inlet 64 and an outlet 65 to which the refrigerating unit may be connected as shown in Fig. 3. Due to the soldered connection between the plate 60 and the expansion coil 61 the vaporization of the refrigerant in the latter will chill the plate more effectively. The base 63 may be formed of cork or other suitable insulating material to prevent the flow of heat from the machine into the expansion coils.

What is claimed is:

1. In a heat seal wrapping machine, the combination with a pair of endless traveling side belts having opposed vertical runs spaced to engage the heat sealed packages by their ends and advance them sidewise, of a pair of side cooling vessels arranged to receive the heat sealed packages therebetween from said side belts and directly engage and chill the heated end folds of the packages, means for simultaneously adjusting said side belts and side cooling vessels to accommodate packages of various lengths, and mechanism for driving said belts in any adjusted position thereof.

2. In a heat seal wrapping machine, the combination with a pair of endless traveling side belts having opposed vertical runs spaced to engage the heat sealed packages by their ends and advance them sidewise, of a pair of side cooling vessels arranged to receive the heat sealed packages therebetween from said side belts and directly engage and chill the heated end folds of the packages, means for simultaneously adjusting said side belts and side cooling vessels to accommodate packages of various length, a thermostatically controlled refrigerating unit for maintaining said side cooling vessels at a uniform temperature, and mechanism for driving said belts in any adjusted position thereof.

3. In a heat seal wrapping machine, the combination with a pair of endless traveling side belts having opposed vertical runs spaced to engage the heat sealed packages by their ends and advance them sidewise, of a pair of side cooling vessels arranged to receive the heat sealed packages therebetween from said side belts and directly engage and chill the heated end folds of

the packages, means for simultaneously adjusting said side belts and side cooling vessels to accommodate packages of various lengths, a stationary bottom cooling vessel arranged to engage and chill the bottom seam of the packages between said side cooling vessels, a traveling bottom belt having an upper run arranged to support the packages between said side belts and acting to advance the packages sidewise between said side cooling vessels on to said bottom cooling vessel, and mechanism for driving said side belts in any adjusted position thereof.

4. In a wrapping machine, the combination with a set of spaced side cooling vessels arranged to admit heat sealed packages therebetween and directly engage and congeal the heated seals on the ends thereof, a bottom cooling vessel arranged to engage and congeal the heat seals on the bottom of the packages, a thermostatically controlled refrigerating device for maintaining said

vessels at a uniform temperature, a set of belts coacting to grip and advance heat sealed packages between said side cooling vessels and then on to said bottom cooling vessel, means for relatively adjusting said belts to accommodate packages of various sizes, and mechanism for driving said belts in any adjusted position thereof.

5. In a wrapping machine, the combination with a cooling vessel arranged to engage and congeal the heated seals on the bottom of heat sealed packages, of a set of belts coacting to grip and advance heat sealed packages on to said vessel, a thermostatically controlled refrigerating device for maintaining said vessel at a uniform temperature, means for relatively adjusting said belts to accommodate packages of various sizes, and mechanism for driving said belts in any adjusted position thereof.

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