

Jan. 11, 1938.

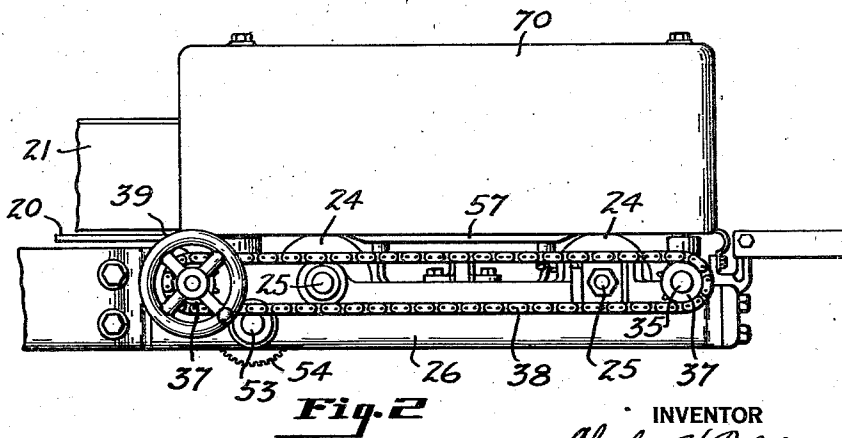
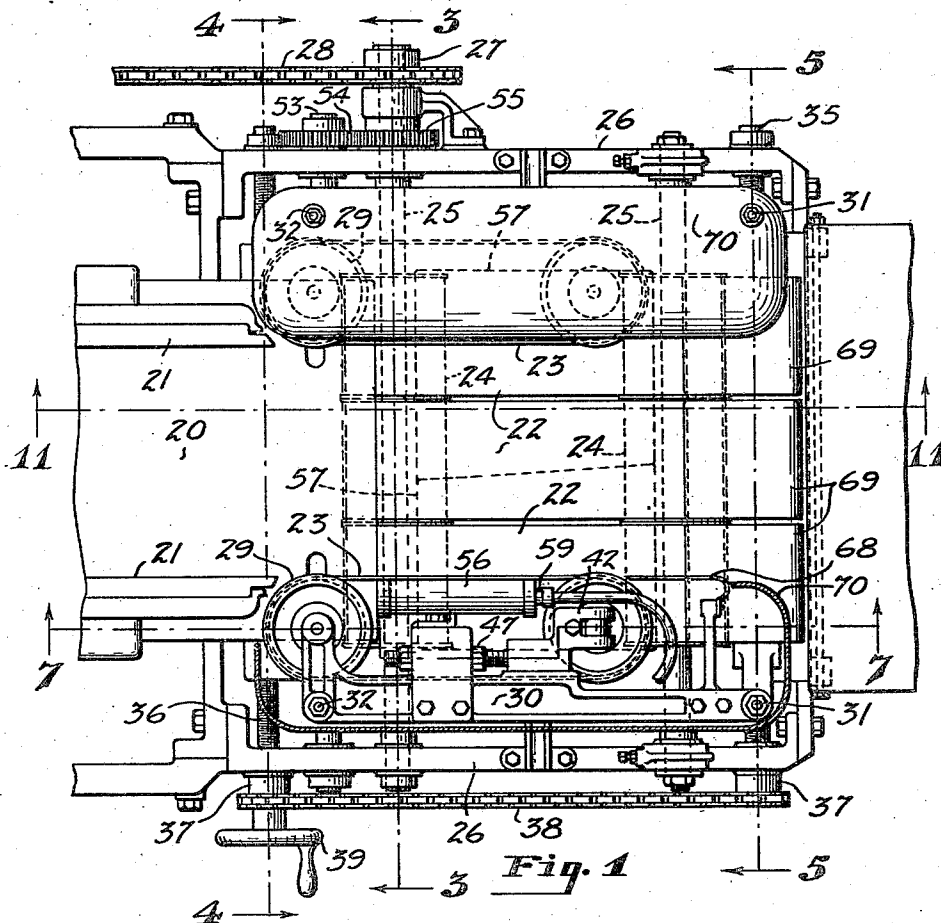
C. H. PETSKEYES

2,105,159

WRAPPING MACHINE

Filed June 1, 1935

5 Sheets-Sheet 1



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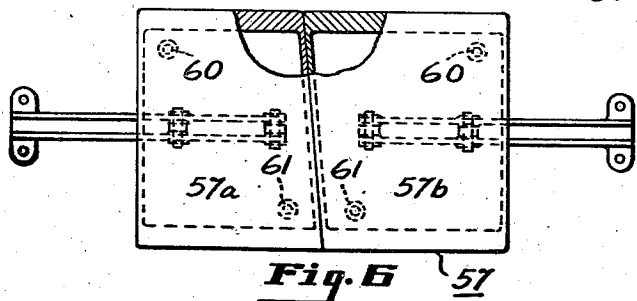
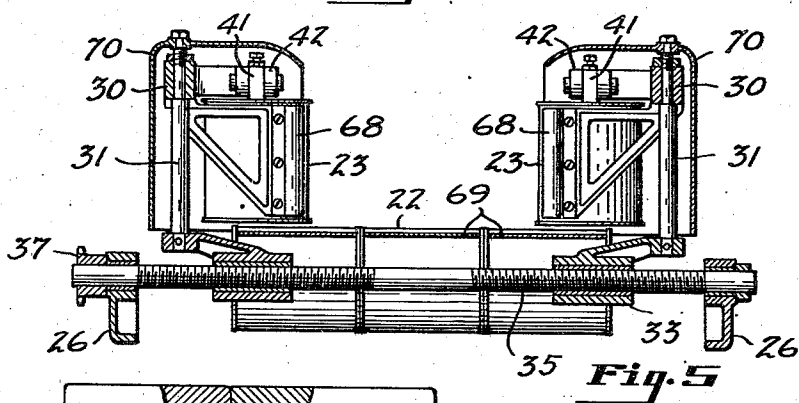
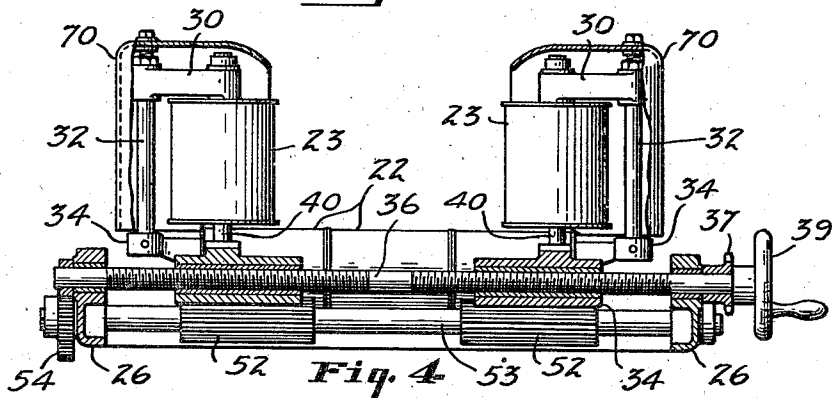
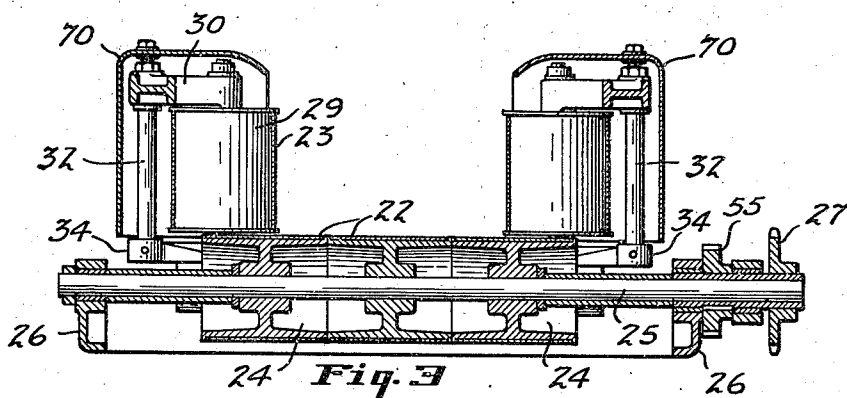
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WRAPPING MACHINE

Filed June 1, 1935

5 Sheets-Sheet 2



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WRAPPING MACHINE

Filed June 1, 1935

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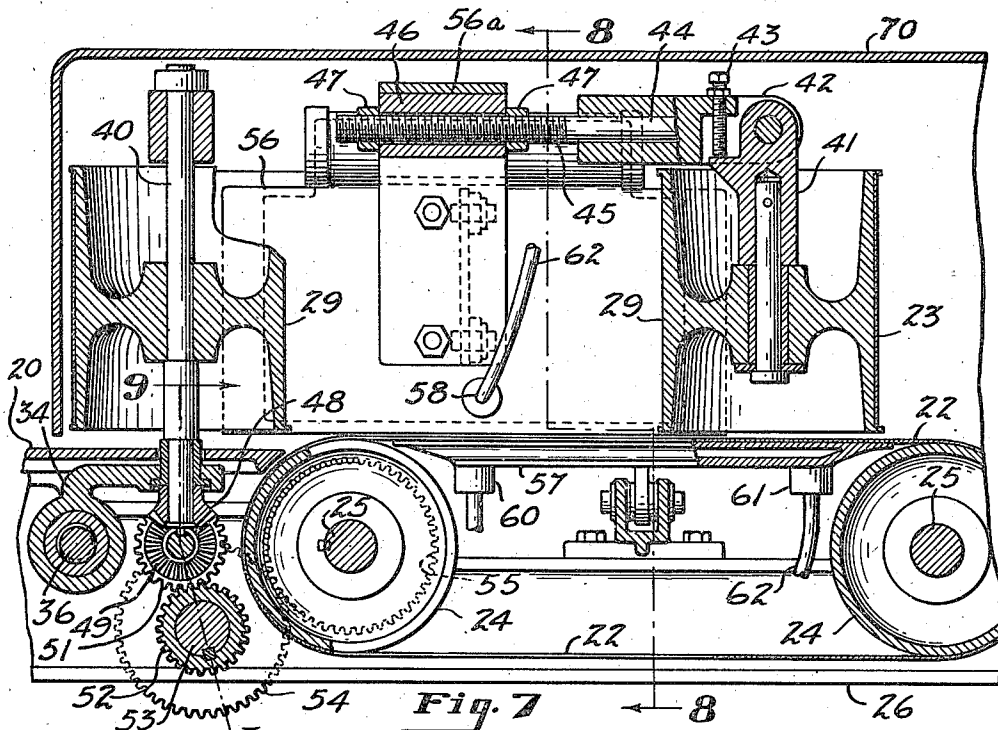


Fig. 7

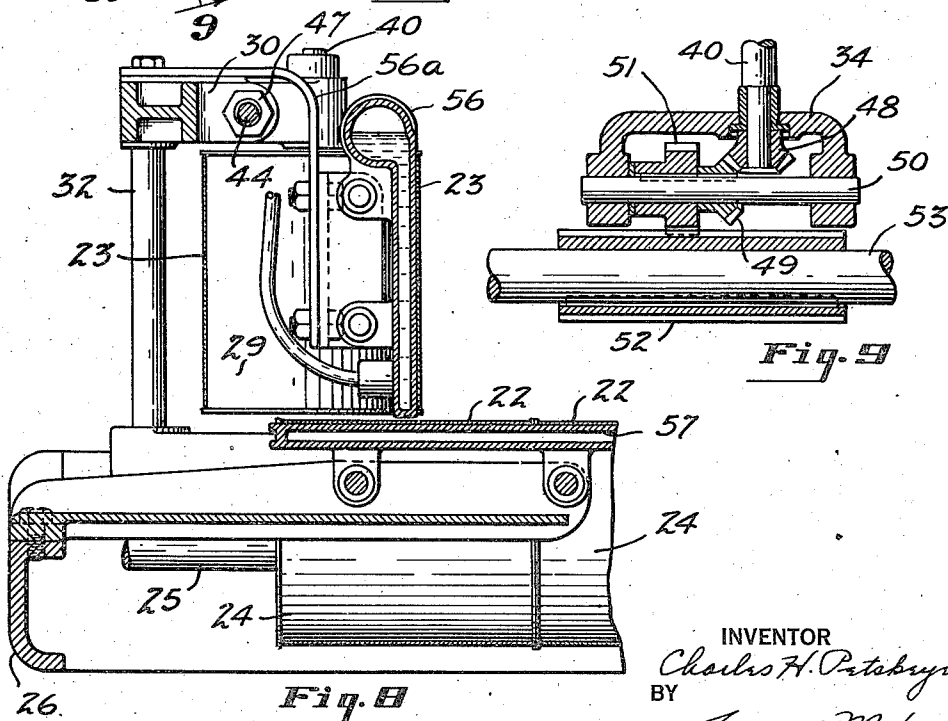


Fig. 8

Fig. 9

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WRAPPING MACHINE

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5 Sheets-Sheet 4

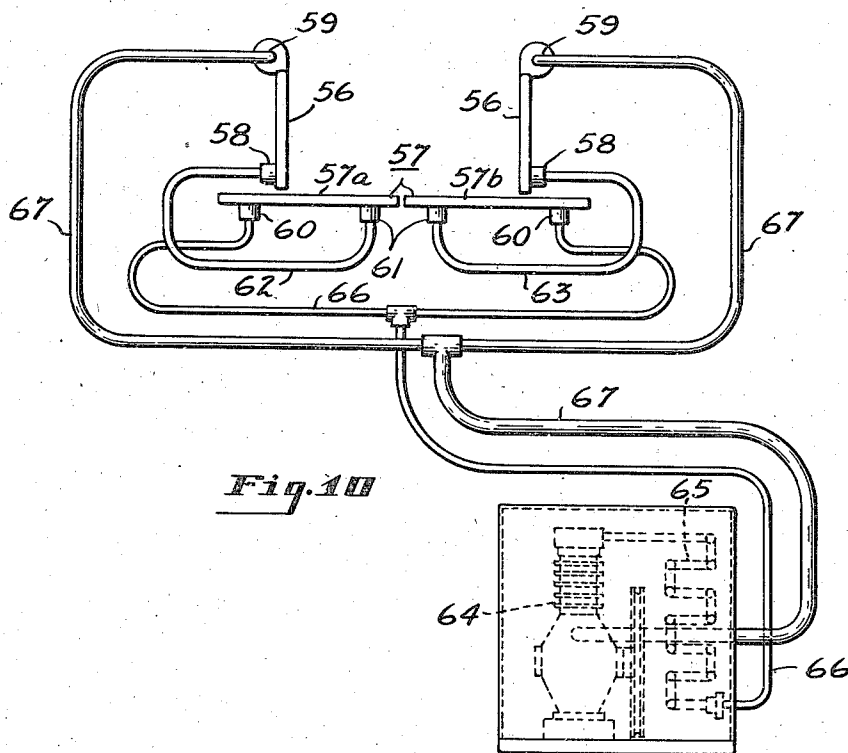


Fig. 10

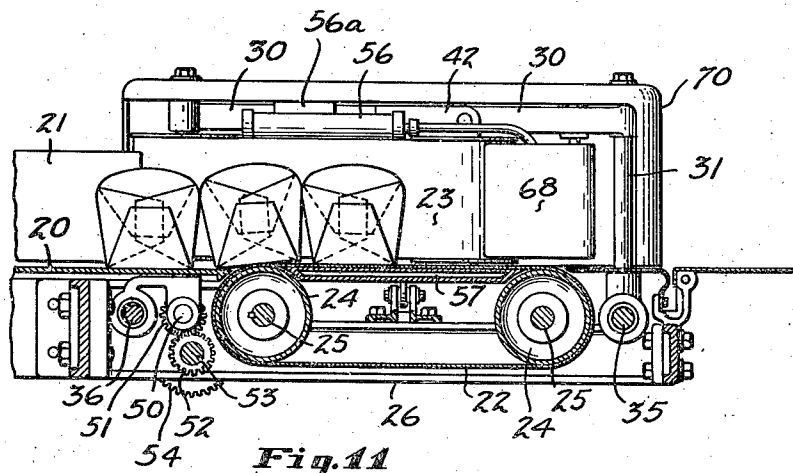


Fig. 11

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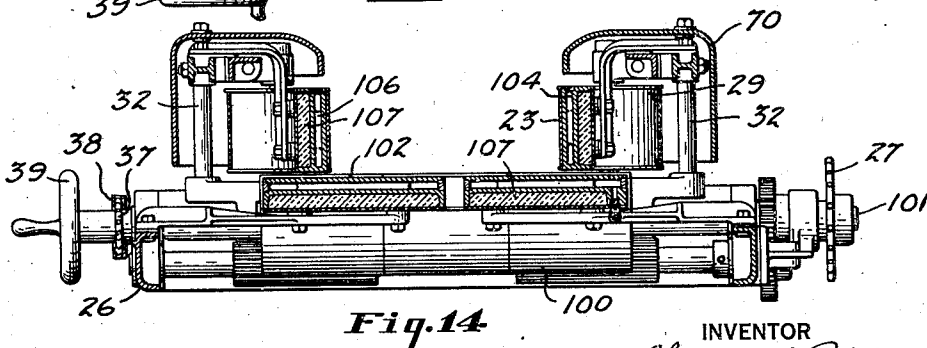
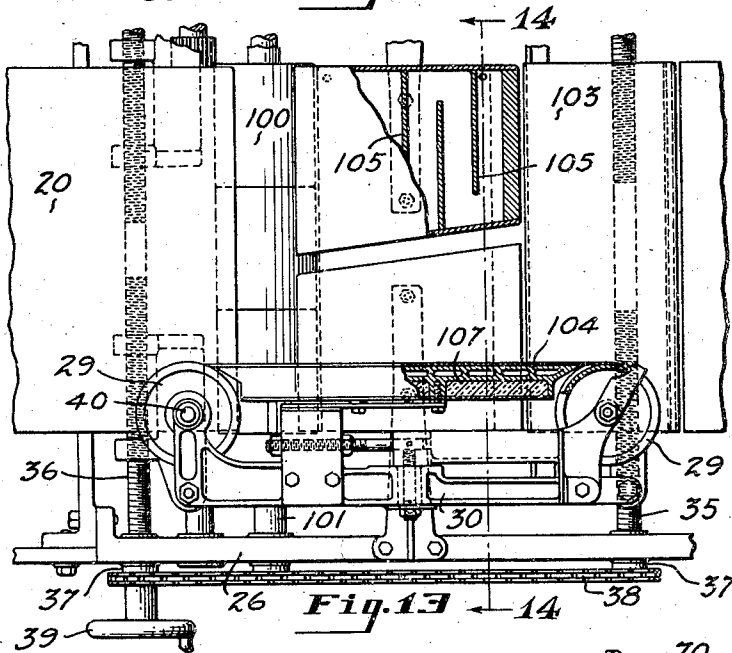
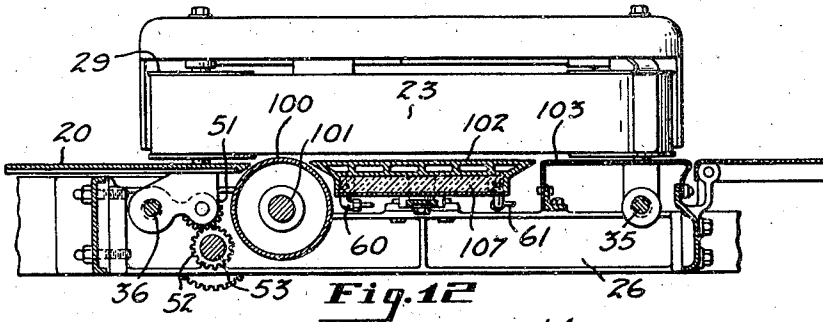
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WRAPPING MACHINE

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5 Sheets-Sheet 5



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2,105,159

WRAPPING MACHINE

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Application June 1, 1935, Serial No. 24,515

13 Claims. (Cl. 93—2)

This invention, which is a continuation in part of my co-pending application Serial No. 726,346, filed May 18, 1934, relates to cooling apparatus for use with wrapping machines to cool sealed portions of a wrapper.

The principal object of the present invention is to provide cooling apparatus for use with wrapped articles, by means of which the article wrapper can be more efficiently sealed.

Another object is to provide cooling apparatus which is of such construction that the sealing material of overlapped portions of an article wrapper can be rapidly congealed to form an efficient seal.

Another object is to provide cooling apparatus for receiving wrapped articles which have been sealed in a heated wrapper sealing device, which apparatus is so constructed as to effect a rapid transfer of heat and thereby rapidly cool heated portions of the article wrapper.

Another object is to provide cooling apparatus for receiving wrapped articles which have been sealed in a heated wrapper sealing device, which apparatus includes metallic wrapped-article conveying belts and means for cooling the belts.

A further object is to provide cooling apparatus for receiving wrapped articles which have been sealed in a heated sealing device, the apparatus including metallic article conveying belts and refrigerated means for cooling the belts.

With the above and other objects in view, the present invention consists in certain features of construction and combinations of parts to be hereinafter described with reference to the accompanying drawings, and then claimed.

In the drawings which illustrate a suitable embodiment of the invention,

Figure 1 is a plan view of the cooling apparatus, a fragmentary portion of a wrapper sealer being shown in association therewith.

Fig. 2 is a side elevation of the apparatus shown in Fig. 1;

Figs. 3, 4 and 5 are transverse sections taken respectively on lines 3—3, 4—4 and 5—5 of Fig. 1;

Fig. 6 is a view partially in plan and partially in section of the lower refrigerating plates;

Fig. 7 is an enlarged longitudinal section taken approximately on line 7—7 of Fig. 1;

Fig. 8 is a transverse section taken approximately on line 8—8 of Fig. 7;

Fig. 9 is a section taken approximately on line 9—9 of Fig. 7;

Fig. 10 is a diagrammatic view showing the general arrangement of the refrigerating plates and chamber and the conduits therefor;

Fig. 11 is a section taken approximately on line 11—11 of Fig. 1 showing the passage of wrapped articles through the cooling apparatus.

Fig. 12 is a longitudinal section of a modified construction in which the bottom conveyor belt has been omitted;

Fig. 13 is a fragmentary plan view of the apparatus shown in Fig. 12; and

Fig. 14 is a transverse section taken approximately on line 14—14 of Fig. 13.

Referring to the accompanying drawings in which like numerals refer to like parts throughout the several views, I have shown the cooling apparatus in association with a heater device of the character shown in my aforesaid co-pending application Serial No. 726,346, filed May 18, 1934, and which includes a lower heater plate 20 and spaced heater side plates 21. The wrapped articles are moved along the plate 20 between plates 21 by the succeeding articles during which time the contacting portions of the overlapping wrapper material are heated and sealed through the heat created by the plates 20 and 21. The wrapped article then moves from between plates 21 to the cooling apparatus of the present invention, wherein there is provided a metallic means for rapidly cooling the overlapping portions of the sealed folds of the wrapping material, which includes the circulation of refrigerant adjacent the portions that contact with the sealed folds, and which permits the use of relatively low temperatures for quickly chilling the heated waxed surfaces of the folds of the wrapper.

This apparatus includes a number of endless bottom conveyor means or belts 22 and spaced side conveyor means or belts 23 all of which are preferably of a thin metal having the property of rapid heat conduction such as copper. The bottom belts 22 operate over spaced front and rear pulleys 24 which are mounted on shafts 25 journaled in supporting members 26. The rearmost shaft 25 is driven by means of a sprocket 27 through the medium of a chain belt 28 from a suitable source of power. It is to be noted here that the bottom heater plate 20 extends up to the rearmost ends of the belts 22 (Figs. 1 and 11) and is disposed a slight distance below the plane of the conveying side of belts 22. Each of the vertical side belts 23 is spaced slightly above the belts 22 and operates from vertical pulleys 29 which are arranged in such a manner that the side belts 23 are offset rearwardly of the bottom belts 22, as indicated in Fig. 11, so that the side belts 23 extend over the heater bottom plate 20.

The side conveyor means 23 are movable to—

ward and away from each other to compensate for different lengths of articles being wrapped, and in order to provide this movement a horizontal support 30 is provided at each side of the mechanism. This support is provided with front and rear depending members 31 and 32, respectively, the front member having an internally threaded bracket 33 and the rear member 32 having an internally threaded bracket 34. The brackets 33 of the two forward supports 30 are carried by the oppositely threaded ends of a screw 35. Similarly, the brackets 34 are carried by the oppositely threaded ends of a screw 36. The screws 35 and 36 are provided with sprockets 37 which carry a connecting drive chain 38 and screw 36 is provided with a hand wheel 39. By rotating the hand wheel 39 the supports 30 can, therefore, be moved relatively to each other to adjust the relative positions of the side conveyor means or belts 23 so that wrapped articles of different length may be accommodated.

The rearward pulley 29 for each side belt is keyed to a vertical shaft 40 which is journaled in the support 30 and bracket 34. The forward pulley 29 for each side plate is rotatably mounted on a spindle supporting arm 41 which is pivoted to a bracket 42, a set screw 43 being provided in the bracket 42 for adjusting the position of arm 41. The bracket 42 carries a rigid member 44 having screw threads 45 thereon, which member extends through a support 46 carried by the supporting member 30, nuts 47 being threaded on the screw threads 45 at opposite sides of the support 46 so as to provide for longitudinal movement of the member 44 whereby the proper tension of the side belt 23 can be obtained.

The vertical shafts 40 of the rear pulleys 29 are each provided at their lower ends with a bevel gear 48 which meshes with a similar gear 49 mounted on a shaft 50 carried by the bracket 34 (Figs. 7 and 9). The shaft 50 has a pinion 51 which meshes with a relatively wide gear 52 rigidly secured to a shaft 53 which is journaled in the members 26. The shaft 53 carries a pinion 54 which meshes with a gear 55 rigidly secured to the rear shaft 25, thus providing means for simultaneously driving the bottom and side conveyor means 22 and 23, respectively.

The side conveyor means or belts 23 are arranged to have substantial sliding contact with chambered heat absorbing elements 56 carried by brackets 56a mounted on the supports 30 (Figs. 7 and 8) and similarly the bottom conveyor means or belts 22 are arranged to have substantial sliding contact with a chambered heat absorbing element 57 carried by the members 26 and which, in order to facilitate removal of the bottom belts, may be comprised of two separate chambers (a) and (b) (Figs. 6 and 10). Each element 56, as shown in Fig. 10, is provided with an inlet and an outlet 58 and 59, respectively, and the chambers (a) and (b) are each provided with an inlet 60 and an outlet 61, the outlet 61 of chamber (a) being connected by a conduit 62 with the inlet 58 of one side element 56 and the outlet 61 of chamber (b) being connected by a conduit 63 with inlet 58 of the other side element 56.

A suitable mechanical refrigerating unit is employed for circulating refrigerant through the chambered elements 56 and 57 which may include a compressor 64 and condenser 65 diagrammatically shown in Fig. 10, the condenser 65 being connected by a high pressure conduit 66 with the inlets 60 of the bottom heat absorbing elements 57a and 57b. The refrigerant is returned

through conduit 67, which is in communication with the outlets 59 of the side heat absorbing elements 56, to the suction or low pressure side of the compressor 64.

By using a cooling device of the type mentioned, the heat exchanging conveyor means or belts 22 and 23, through contact with the heat absorbing elements described, can be cooled to relatively low temperature such as for example 15° above zero or any other higher or lower temperature, if desired, thus providing a means for rapidly congealing the melted wax between the folds of the wrapping material, and which thereby permits the attainment of efficient, long lasting seals.

As there may be some tendency for the ends and bottom of the wrapper to stick to the chilling belts 22 and 23, I have provided at the ends thereof (Figs. 1 and 11) metallic side and bottom scrapers 68 and 69 which have thin edges, respectively, in substantial engagement with the chilling and heat exchanging conveyor means or belts 23 and 22. These scrapers 68 and 69 provide an efficient means for breaking the wrapper away from the belts and also for removing any wax that may have accumulated on the chilling belts 22 and 23.

Suitable housings 70 may be provided for enclosing the side cooling devices 56 and the upper edges of the belts 23, and these housings may be supported on the supporting elements 31 and 32, as shown in Figs. 3, 4, 5 and 8.

By arranging the side chilling and heat exchanging conveyor means or belts 23 so that they engage the wrapped article ahead of the lower chilling and heat exchanging conveyor means or belts 22 and by having the upper sides of the belts 22 slightly above the plane of the bottom heater plate 20, it will be observed that a slightly curved surface will be presented to the advancing articles as illustrated in Fig. 11, which will insure that the overlapping bottom folds will be engaged by the bottom chilling and heat exchanging conveyor means or belt 22 and properly chilled. This is particularly advantageous in the case where the bottom of the article, such as bread, is dished, as the overlapping bottom portions of the wrapper will be fully engaged by the bottom belts as they are moved onto the same to press the overlapped wrapper portions firmly against each other. Also, as the wrapped article is first engaged by the side belts, the side edges of the article, in the case of wrapped bread, will be slightly compressed as the article is carried onto the bottom chilling and heat exchanging conveyor means or belts, thus insuring a substantial contact of the bottom of the wrapped article with the bottom chilling and heat exchanging conveyor means or belt 22.

In the operation of the cooling apparatus described, the same is operated at relatively low temperatures, such as below freezing, so that the heat absorbing devices which contact the horizontal and vertical belts may become coated with ice, in which case the belts operate over the iced surface and provide for a very rapid exchange of heat, whereby the adhesive or molten wax between the sealed portion of the wrapper are very rapidly congealed.

In some instances it may be desired to remove the bottom or horizontal belts and allow the bottom of the wrapped article to contact directly with the horizontal heat exchanging members 57, and in the construction shown in Figs. 12 to 14 the apparatus is for the most part the same as shown in Figs. 1 to 11 with the exception that the horizontal or bottom belts have been omitted.

ted. Because of the similarity in construction, the same reference numerals, wherever applicable, will apply.

The vertical side belts 23 are operated in the same manner as previously described, over pulleys 29.

The wrapped articles, as they move along the bottom plate 20 of the heater, are brought into engagement with the side belts 23 which carry the articles along the heater plate for some distance, and to aligned drums 100 mounted on a rotatable shaft 101. The shaft 101 may be driven in the same manner as the shaft 25 shown in Fig. 1, and also may drive through the gearing previously described, the side belts 23. The plane of the heater plate 20 is below the top surface of the drums 100 so that the article is caused to travel over a curved surface in order that in case the bottom of the article is dish, the overlapping portions of the wrapper at the bottom of the article will be pressed into firm engagement with each other against the bottom of the article.

The side belts 23 then carry the article to the horizontal portion of the cooling device which comprises a pair of chambered heat absorbing devices 102 through which the refrigerant is circulated, and then carry the article to a horizontal table portion 103 which is adjacent the members 102. The lower heat absorbing devices 102 and the vertical heat absorbing devices 104 over which the side belts 23 operate, provide means for the circulation of the refrigerant, the same as the members 56 and 57 of Figs. 7 and 8, and are connected to a refrigerant compressor and other mechanism in any suitable manner such for example as the arrangement diagrammatically illustrated in Fig. 10.

By utilizing a device of the character described, relatively low temperatures may be had to rapidly chill and congeal the adhesive between the overlapping portions of the wrapper, which are brought into contact with the cold side belts 23 and bottom belts 22 in the case of the construction shown in Figs. 1 to 8, or the heat absorbing devices 102 in the case of the construction shown in Figs. 12 to 14.

The cooling apparatus may be adjusted so that the same may be operated and provide for below freezing or below zero temperatures if desired, so that the chambered members or heat absorbing devices may become coated with ice, in which event the wrapper portions at the bottom of the article will, if the construction shown in Figs. 12 to 14 is employed, be caused to move along and in contact with an iced surface, which will cause the adhesive to congeal very rapidly.

The heat absorbing devices 102 are provided with internal baffles 105 for causing the refrigerant to follow a predetermined path there-through in order to uniformly maintain the surface thereof at the desired temperature. The vertical cooling devices 104 may also be formed with similar baffles 106. Also, the sides of the heat absorbing devices 104 opposite the article or belt engaging sides thereof may be insulated with any suitable insulation material 107 to increase the effectiveness of the sides thereof which engage the article or the movable belts.

A cooling apparatus of the character described provides a means for rapidly congealing the heated wrapper material to provide for an efficient and firm seal.

The apparatus is adaptable for use with wrapped articles of various sizes and is particularly adaptable for use in cooling wrapped bread

wrappers, although it is also adaptable for use with other wrapped articles.

Furthermore, it is to be understood that the particular form of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

What I claim is:

1. A wrapped article supporting member, rotatable means having an upper surface adjacent to and extending above the plane of said member and having its axis of rotation positioned substantially parallel with and below the plane of the supporting member, a pair of spaced endless side belts for engaging the ends of the wrapped article, said side belts extending over and overlying the ends of said rotatable means and portions of the supporting member, and means for moving said side belts whereby to convey the article from said supporting member and cause the bottom of the article to firmly engage said rotatable means.

2. A wrapped article supporting member, and a cooling device including a refrigerated endless bottom heat exchanging conveyor means having its upper side in a plane spaced above the plane of said member and traveling on a roller positioned adjacent the end of the supporting member with the roller's upper surface disposed slightly above the plane of the supporting member and a pair of endless side heat exchanging conveyor means extending in advance of said bottom heat exchanging conveyor means and overlying said member, said member having its forward edge relatively close to said bottom heat exchanging conveyor means, whereby all portions of the bottom surface of the article will engage the bottom heat exchanging conveyor means and be compressed.

3. Apparatus for cooling the sealed overlapping portions of the wrapper of a wrapped article comprising horizontally rotatable means and spaced vertically arranged heat exchanging conveyor means disposed above said rotatable means for respectively engaging the bottom and ends of the wrapped article, means for simultaneously moving said heat exchanging conveyor means and rotatable means in the same direction to convey the wrapped article, a loading plate having one end adjacent to and disposed in a plane below said rotatable means, heat absorbing devices each having a face adjacent said heat exchanging conveyor means in heat exchanging relation, and means for circulating a refrigerating medium through said heat absorbing devices.

4. Apparatus for cooling the sealed overlapping portions of a wrapped article comprising horizontally arranged metallic conveyor means and spaced vertically arranged belt means disposed above said first conveyor means for respectively engaging the bottom and ends of the wrapped article, means for simultaneously moving said conveyor means in the same direction to convey the wrapped article, a loading plate having one end adjacent to and disposed below the plane of the conveying side of said first mentioned conveyor means, the feeding ends of said vertically arranged belt means projecting in advance of said first conveyor means and being disposed above said loading plate, heat absorbing devices each having a face adjacent a conveyor means in heat exchanging relation, and means for cir-

culating a refrigerating medium through said heat absorbing devices.

5. Apparatus for cooling the sealed overlapped portions of a wrapped article, comprising an endless metallic conveyor means for contacting a sealed wrapper portion, a stationary heat absorbing element engaging said conveyor means, means for moving said conveyor means, and a stationary member having a relatively sharp edge engaging said conveyor means for removing foreign matter from said conveyor means, such as accumulated adhesive, and separating the adjacent wrapper portion therefrom.

6. Apparatus for cooling the sealed overlapping portions of a wrapped article comprising horizontally arranged metallic belt means and spaced vertically arranged belt means disposed above said first belt means for respectively engaging the bottom and ends of the wrapped article, means for simultaneously moving said belt means in the same direction to convey the wrapped article, a sharp edged member substantially engaging each belt means at the discharge end thereof, the edge of the member being substantially in the plane of the conveying side of the belt means, heat absorbing devices each having a face adjacent a belt means in heat exchanging relation, and means for circulating a refrigerating medium through said devices.

7. Apparatus for cooling the sealed overlapping portions of a wrapped article, comprising horizontally arranged heat exchanging conveyor means for engaging the underside of the wrapped article, spaced, parallel, vertically arranged heat exchanging conveyor means disposed above the horizontal conveyor for engaging opposite ends of the wrapped article, a vertical cooling member for each of the vertical conveyor means in heat exchanging contact therewith, said members each having a refrigerant inlet and a refrigerant outlet, the outlet being at the top and remote from the inlet, a plurality of horizontal cooling members for the horizontally arranged conveyor means in heat exchanging contact therewith, said horizontal cooling members each having a refrigerant inlet and a refrigerant outlet, a plurality of refrigerant inlets of the horizontal cooling members connected in parallel by refrigerant conduits and in communication with a common refrigeration feed conduit to receive fresh refrigerant from a common source, a plurality of refrigerant outlets of the horizontal cooling members individually connected by separate refrigerant conduits to a plurality of refrigerant inlets of the vertical cooling members, the refrigerant outlets at the top of the vertical cooling members being connected in parallel with one another and in communication with a common discharge conduit, whereby refrigerant flowing through the apparatus passes first through the horizontal cooling members for cooling the horizontal conveyor means and then simultaneously and evenly upwardly into the vertical cooling members for cooling the spaced, parallel, vertical conveyor means, and a mechanical refrigeration mechanism for feeding fresh refrigerant to the inlets of the horizontal cooling members and for receiving refrigerant from the outlets of the vertical cooling members.

8. A wrapped article supporting member, rotatable means having an upper surface adjacent to and extending above the plane of said member and having its axis of rotation positioned substantially parallel with and below the plane of the supporting member, a pair of spaced endless

side belts for engaging the ends of the wrapped article, said side belts extending over and overlying the ends of said rotatable means and portions of the supporting member, means for moving the side belts to convey an article from the supporting member and cause the bottom of the article to firmly engage the rotatable means, and means disposed on the opposite side of the rotatable means from the supporting member for receiving the article after the latter has been engaged by said rotatable means and prior to the release of the article by the side belts.

9. A wrapped article supporting member, rotatable means having an upper surface adjacent to and extending above the plane of said member and having its axis of rotation positioned substantially parallel with and below the plane of the supporting member, a pair of spaced endless side belts for engaging the ends of the wrapped article, said side belts extending over and overlying the ends of said rotatable means and portions of the supporting member, means for moving the side belts to convey an article from the supporting member and cause the bottom of the article to firmly engage the rotatable means, and means disposed on the opposite side of the rotatable means from the supporting member for receiving the article after the latter has been engaged by said rotatable means and prior to the release of the article by the side belts, said article receiving means comprising a chambered member arranged to have refrigerant circulated there-through to absorb heat from overlapped portions of wrapping material after said portions have been engaged by the rotatable means.

10. A wrapper sealing apparatus, comprising a pair of spaced pulleys rotatable about substantially parallel axes, an endless, continuous, smooth surfaced, relatively thin sheet metal conveyor means carried between the pulleys and providing a flat surfaced, article-contacting lap and return lap, said conveyor means being inextensible and of sufficient flexibility to permit a multiplicity of alternate bendings as it is carried around the pulleys and laps, means for varying the distance between the pulley axes to tension the inextensible conveyor means, said distance varying means being the sole adjustment for tension in the conveyor means, the inextensible conveyor means being carried around the pulleys solely by frictional engagement therewith, a heat absorbing refrigerant tank disposed between the laps and in direct and intimate contact with the article-contacting lap for withdrawal of heat therefrom, whereby heat exchanged between overlapped portions of wrapping material on an article in engagement with the article-contacting lap, and the refrigerant, passes through a minimum of intervening material solely of metallic composition, means for circulating fluid refrigerant through said tank, and means for rotating one of the pulleys to actuate the inextensible conveyor means.

11. A wrapper sealing apparatus, comprising a pair of spaced pulleys rotatable about substantially parallel axes, an endless, continuous, smooth surfaced, relatively thin sheet metal conveyor means carried between the pulleys and providing a flat surfaced, article-contacting lap and return lap, said conveyor means being inextensible and of sufficient flexibility to permit a multiplicity of alternate bendings as it is carried around the pulleys and laps, means for varying the distance between the pulley axes to tension the inextensible conveyor means, means for ad-

justing the direction of the axis of one pulley with respect to the direction of the axis of the other pulley to compensate for slight differences in length of the marginal edges of the inextensible conveyor means and provide substantially uniform frictional engagement of the pulleys and conveyor means, said distance varying means and direction adjusting means being the sole adjustment for tension in the conveyor means, the inextensible conveyor means being carried around the pulleys solely by frictional engagement therewith, a heat absorbing refrigerant tank disposed between the laps and in direct and intimate contact with the article-contacting lap for withdrawal of heat therefrom, whereby heat exchanged between the refrigerant and overlapped portions of wrapping material on an article in engagement with the article-contacting lap, passes through a minimum of intervening material solely of metallic composition, means for circulating fluid refrigerant through said tank, and means for rotating one of the pulleys to actuate the inextensible conveyor means.

12. A wrapper sealing apparatus, comprising spaced, substantially parallel, vertically arranged, endless conveyors for engaging opposite ends of a wrapped article and advancing the article through the apparatus, each conveyor carried on a pair of spaced pulleys rotatable about parallel axes, shafts for carrying the pulleys, means for supporting the shafts, one of each pair of pulleys, having its shaft supported solely at the upper end thereof, a horizontally arranged endless conveyor, carried on spaced pulleys having parallel axes of rotation, for engaging the underside of a wrapped article and supporting the same, said horizontal conveyor extending between the vertical conveyors and disposed below and closely adjacent the bottom edges thereof, means for moving the vertical conveyors toward and away from each other to accommodate articles of varying size, and the limit of movement toward each other being sufficient to cause the axes of the pulleys which have their shafts supported solely

at upper ends to move inwardly of the side marginal edges of the horizontal conveyor, the last named axes being disposed between the axes of the horizontal conveyor pulleys, and means for actuating the conveyors to advance articles through the apparatus.

13. A wrapper sealing apparatus, comprising spaced, substantially parallel, vertically arranged, endless conveyors for engaging opposite ends of a wrapped article and advancing the article through the apparatus, each conveyor carried on a pair of spaced rotatable pulleys mounted on parallel shafts, a horizontally arranged endless conveyor carried on spaced pulleys mounted on parallel shafts for engaging the underside of a wrapped article and supporting the same, said horizontal conveyor extending between the vertical conveyors and disposed below and closely adjacent the bottom edges thereof, means for supporting the shafts, one of each pair of pulleys for the vertically arranged conveyors having its shaft supported solely at the upper end thereof and the companion pulley of said pair secured to its shaft and such shaft extending below the level of the horizontal conveyor, means for driving the last described shafts of the vertical conveyors in timed relation with one another to actuate the conveyors in article-advancing movement, means for moving the vertical conveyors toward and away from each other to accommodate articles of varying width, and the limit of movement toward each other being sufficient to cause the axes of the pulleys which have their shafts supported solely at upper ends to move inwardly of the side marginal edges of the horizontal conveyor, and the horizontal conveyor positioned with respect to the vertical conveyors, so that the ends of the vertical conveyors carried by the pulleys supported by the driven shafts extend beyond the corresponding ends of the horizontal conveyor and the opposite end of the horizontal conveyor extends beyond the ends of the vertical conveyors associated therewith.

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