Dec. 4, 1962 H. F. GOODWIN ET AL 3,066,459

METHOD AND APPARATUS FOR APPLYING SEALED WRAPPINGS

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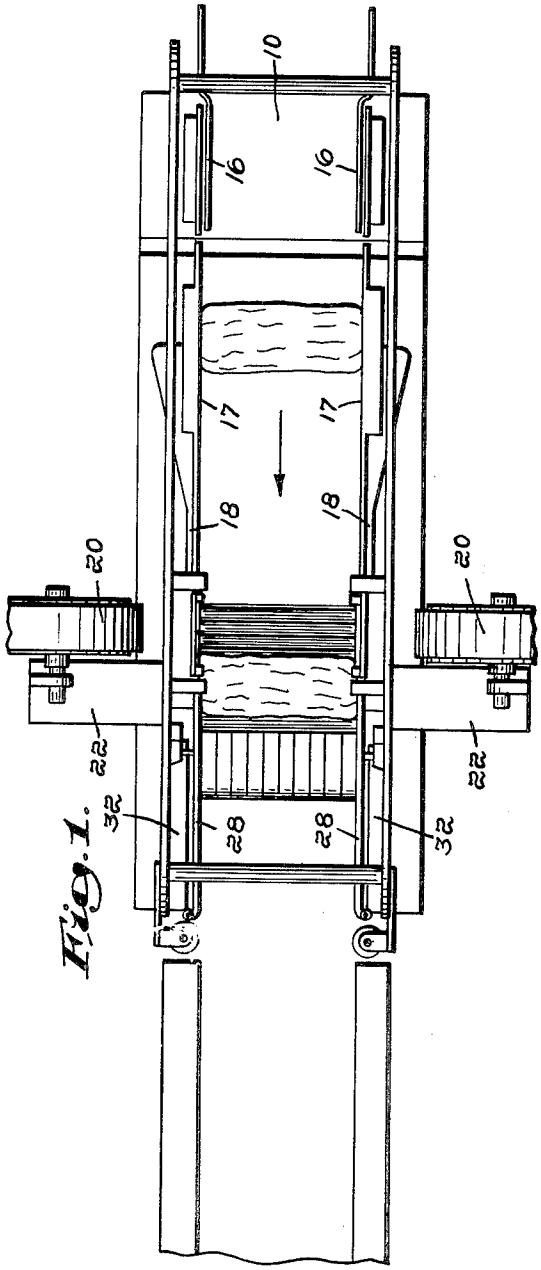


Fig. 1.

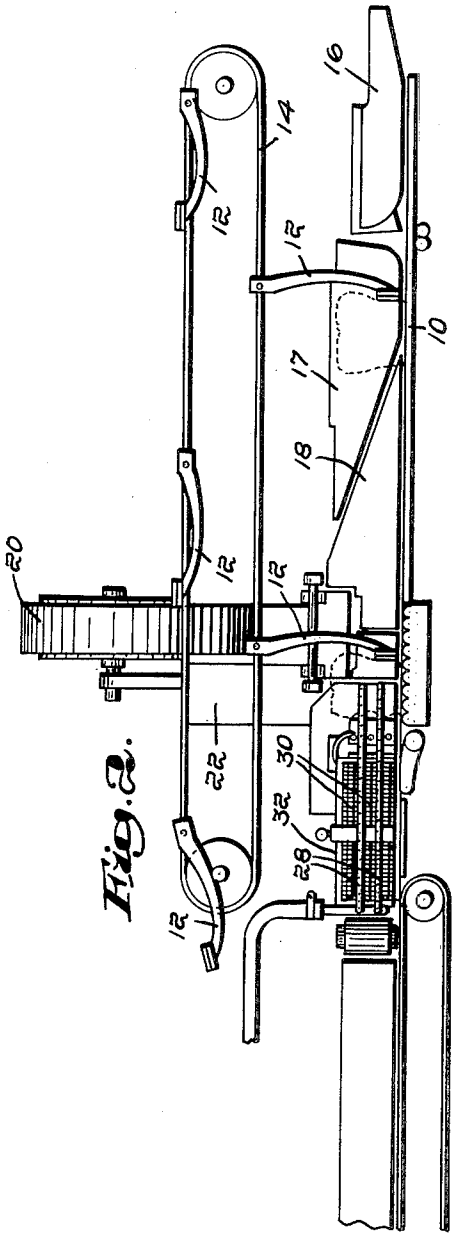


Fig. 2.

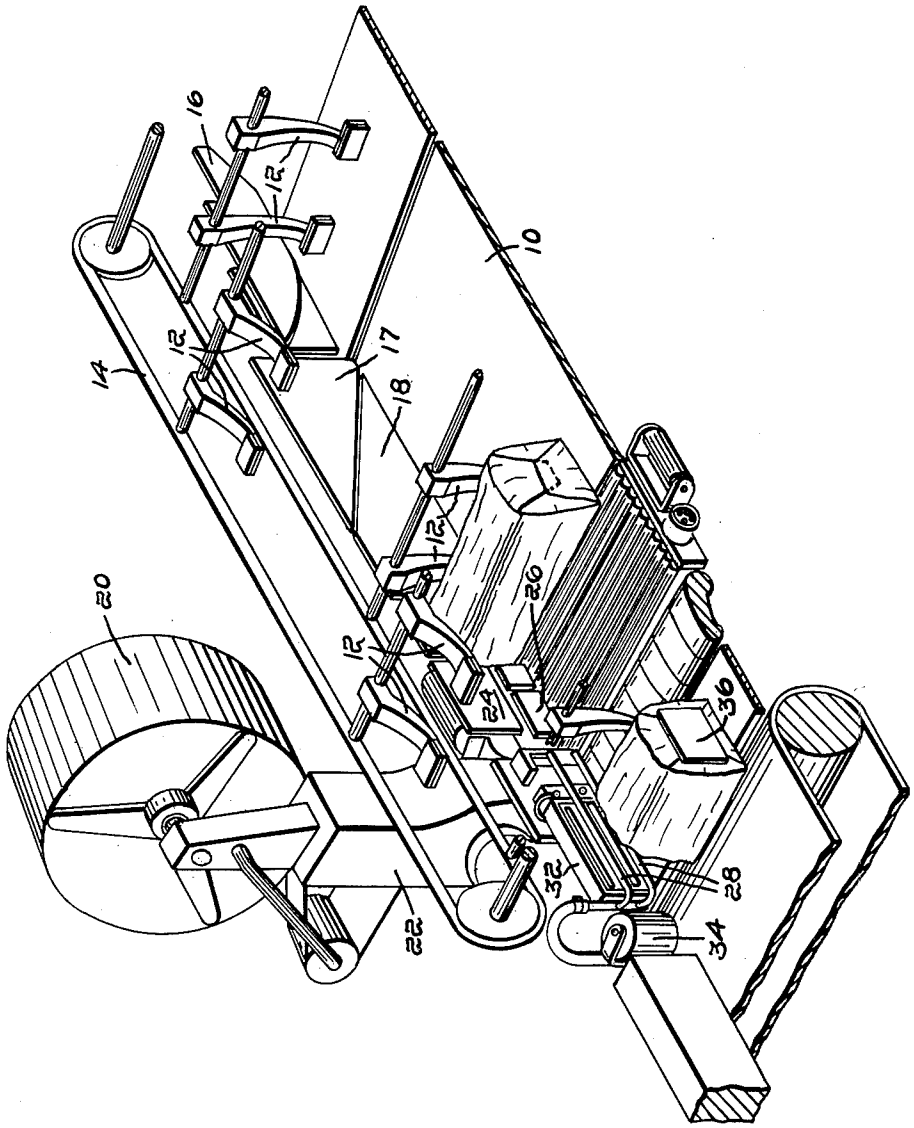
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Fig. 3.



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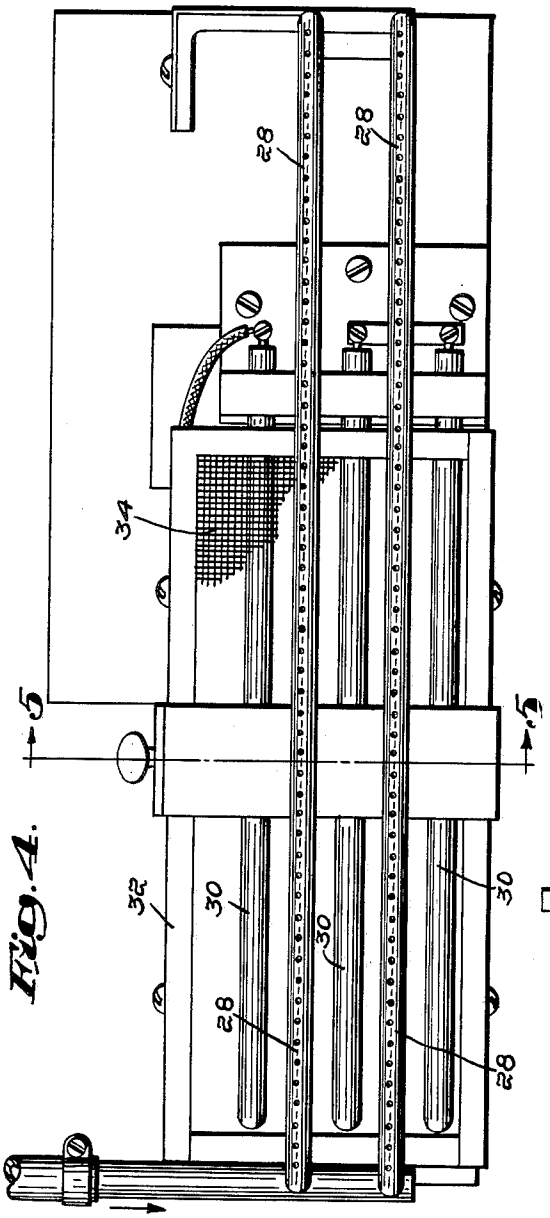


Fig. 4.

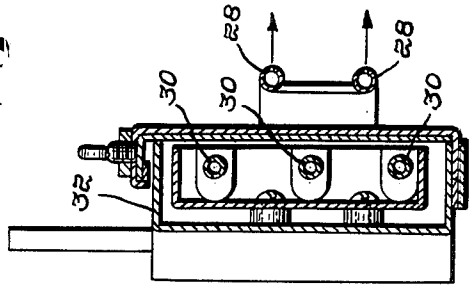


Fig. 5.

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METHOD AND APPARATUS FOR APPLYING SEALED WRAPPINGS

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This invention relates to a method and mechanism for practicing the same, both useful in packaging commodities in a sealed enclosing wrapping.

While not limited to such use the invention finds particular application to the packaging of bread and also to the packaging of commodities (including bread) in a wrapping film of thin thermoplastic material such, for example, as polyethylene and polypropylene. It will be convenient therefore in order to promote a ready comprehension of the subject matter to describe the invention as utilized for wrapping a loaf of bread with such film and to illustrate it in the accompanying drawings by the showing of a mechanism specifically adapted to such purpose. It will be clear that the method is not limited to use for that particular purpose, nor the mechanism to one designed for that particular application.

With this in mind the invention will be well understood by reference to the following description taken in connection with the accompanying drawings wherein:

FIG. 1 is a fragmentary plan view of a portion of a bread wrapping machine having embodied in it a sealing mechanism exemplifying the invention. The loaf advancing mechanism is omitted;

FIG. 2 is a central vertical section showing in elevation the same parts at one side of the machine and includes the loaf advancing mechanism;

FIG. 3 is a perspective view of what appears in FIG. 2;

FIG. 4 is a view on a larger scale and in front elevation of the sealing unit exemplifying the invention, the point of view being the same as in FIG. 2; and

FIG. 5 is a section on the line 5—5 of FIG. 4.

The larger proportion of commercially baked bread in the United States is sold wrapped. For many years the wrapping was almost always waxed paper (which still is used). A blank was wrapped around the shorter circumference of the bread and its ends folded in as overlapping flaps at each end of the loaf. For many years past an "end label" has generally been applied to these flaps and adhered thereto to hold the flaps and to seal the wrapping. This end label usually was a label in that it had an inscription on its outer surface, but it functioned as a sealing sheet and the word "label" is used in that sense in this description.

A wax coating could be softened by heat and a reasonably satisfactory seal made, and various heat activatable adhesisves (heat seal adhesives) have been developed for securing a label to a waxed wrapping. Direct contact of a heated pressure plate was utilized to secure the label in position. Wrappings with cellophane and end labels were effected in a substantially similar manner. Relatively recently thin, transparent films of thermoplastic, such as polyethylene, have become available and in themselves they make a desirable wrapping for a loaf of bread. However, if it is attempted to handle them in the manner suggested many difficulties arise. Direct contact of these films with a heated plate causes them to soften excessively and the result is rupture, warping, loss of fit, and other damage to the wrapper of the loaf. Moreover, the softened film had considerable adhesive qualities and would stick to the metal plunger and other adjacent objects which came in contact with it, causing breakage. If the sealing temperatures were lowered to avoid damage to the wrapping film, ineffective activation of the end label and imperfect sealing resulted.

In accordance with the present invention serious damage to wrapping films which soften at comparatively low temperatures is avoided because they are not handled by direct physical contact with metal or other parts during the sealing operation, while activation of the adhesive is effected by heat developed within the adhesive joint by the absorption of radiant heat, preferably in the infra-red range.

Referring now to FIGS. 1, 2 and 3 of the drawings, there is there disclosed in a somewhat diagrammatic and schematic manner a portion of a bread wrapping machine at that point in its length where the ends of the wrapping are sealed. The portions which are broken away at the right and left of the figure may be of well known and conventional construction and do not require illustration or description here. Referring to the drawings, a loaf of bread which at an earlier point has been wrapped around its smaller girth with a sheet of wrapping material such as polyethylene film with projecting ends, is advanced over a table 10 by a pusher bar 12 depending from an overlying conveyor 14, and these projecting ends are formed into pleats and folded down by folding plates and tucking mechanism, portions of which are shown at the locations 16, 17, 18. As the bread passes these the wrapper is completely formed about it and the ends folded in and ready for sealing, as seen at the right in FIG. 3.

The end labels are supplied from rolls 20 at either side of the machine. The strip leads through a dispensing mechanism 22 and single labels are cut off by knife 24, FIG. 3, opposite the end of the loaf and pressed lightly thereagainst by a suitable plunger 26 over which the loaf and the still unattached label slide toward the left in FIGS. 1, 2 and 3, to be acted on by the mechanism more particularly involved in the present invention and exemplifying the novel method of effecting the adhesive bond.

The details of the mechanism are shown on a relatively large scale in FIGS. 4 and 5. As the loaf with its unsealed wrapper moves away from the place where the end labels are presented to the ends thereof it comes under the influence of two horizontal sheets of air blown inwardly from upper and lower perforated pipes 28 spaced vertically at a distance less than the height of the label, which blow against the label and the end of the loaf and hold the former pressed against the latter as the loaf continues its travel. While still under the influence of these sheets of air radiant heat is applied to heat the label and activate its adhesive coating and there is here shown a tier of three elongated tubular infra-red lamps 30 received in an open topped box 32, the bottom of which is formed as a reflector. A portion of a protective screen over the open front of the box is shown broken away in FIG. 4. The radiant energy from these lamps where it falls on the transparent wrapping sheet proper passes through the same and is absorbed harmlessly into the loaf without developing any substantial heat to cause softening or distortion of the sheet, which is furthermore cooled by the air which streams over it after it encounters the end of the loaf. On the contrary, in the location of the end label (36 at the left on FIG. 3) the covering including the paper of the label, the heat-sensitive adhesive layer on its inner face and the multiple layers of the flaps beneath the same folded inwardly are of such thickness and relative opacity as to have a substantial heat absorbing capacity resulting in activation of the adhesive which grabs hold of the underlying film while the label is held immovably relative to the wrapping and the loaf by the same columns of pressure of the air. There is no contact of any heated parts or indeed of any solid bodies with the end of the wrapping or with the label at this time.

After adhesion is effected in this way the ends of the

loaf with the adherent labels may, if desired, pass in contact with an idler drum 34 to iron out the area treated and further to insure complete sealing. The loaf may move further in the machine to a location not illustrated, and the area here may be a cooled environment to harden or set the adhesive in the manner conventional in the case of end labels as applied to wax paper or cellophane wrappers in the prior art.

It has been proposed hitherto to activate labels having a heat seal coating (preferably one of the two phase or "delayed action" type described in the Perry Patent 2,462,029) by radiant heat incident on the exposed face of the adhesive after which the label was moved to and pressed against the object to which it was to be attached and thus is not claimed. The heat in the present case is generated internally of the temporary assembly of label and object and the activation occurs in situ.

We are aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and we therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claims to indicate those prinicples of the invention exemplified by the particular embodiment described and which we desire to secure by Letters Patent.

We claim:

1. The method of closing a wrapping of thin transparent thermoplastic material about articles which comprises folding a sheet of such material about the article and forming edge portions thereof into overlapping flaps, applying over the flaps a relatively opaque joining member of relatively high heat-absorbing capacity having a heat-seal coating, holding the joining member in position by a current of air directed against its uncoated face and securing cohesion of the flaps and the overlying member by radiant heat projected externally against the joint.

2. Mechanism for enclosing a commodity in a sealed wrapping comprising a support for receiving the commodity with unsealed wrapping material folded thereabout, means for positioning over the portions to be sealed a joining label having a heat-seal coating, means for maintaining the label in position by projecting a current of air thereagainst and means for radiating heat from a remote source on the so collocated parts to develop reciprocal adhesiveness therein.

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