The present invention relates to improvements in a vacuum bag sealing machine, and its principal object is to provide certain improvements in machines similar to those described in my co-pending applications, Serial Numbers 486,797, now Patent No. 2,844,925; 551,176; and 550,921, now Patent No. 2,870,591.

Machines of this type usually consist of a platform adapted to have a series of open-ended bags positioned thereon, a hollow housing hinged thereto and adapted to be lowered upon the platform so as to form a chamber therewith, the machine being evacuated by means of a vacuum motor so as to pull the air out of the bags, possible means for re-filling the bags with an inert gas, and sealing elements operable to descend upon the open ends of the bags for heat-sealing the same.

The present invention is directed principally to the positioning of the bags on the platform prior to the evacuation process in such a manner that it may be carried out with a minimum of hand labor and at a great saving of time.

In this connection it is proposed to limit the amount of labor necessary to the mere placing of the bags in marked positions and to cause the descending cover to press or anchor the open end of the bag upon the platform.

It is further proposed to cause the cover or housing to merely anchor opposing edges of the bags upon the platform so as to leave the major portion of each bag open for evacuation of air from each bag and re-introduction of an inert gas.

It is further proposed to provide certain improvements in the feeding of the inert gas in such a manner that the gas is fed in the form of jets directed toward the open ends of the bags substantially in the plane thereof, whereby the gas sweeping over the open end of each bag produces a lifting effect on the upper sheet of the bag and tends to further open the bag for free admission of the gas thereinto.

It is additionally proposed to cause the heat sealing member to descend upon the open ends of the bags after the bags have been filled with inert gas, and to cause the descending heat element, prior to its sealing engagement with the bag, to act on one of the bag anchoring means for pulling the end edge of the bag engaged thereby endwise for stretching the open end of the bag to present perfectly flat surfaces to the sealing element before the latter becomes active.

Further objects and advantages of my improved vacuum bag sealing machine will appear as the specification proceeds, and the new and useful features of this invention will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawings, forming part of this application, in which:

FIGURE 1 shows a perspective view of my vacuum bag sealing machine;
FIGURE 2, a plan view, on an enlarged scale, of the machine in fully open position;
FIGURE 3, a cross-section taken along line 3—3 of FIGURE 2;
FIGURE 4, a cross-section taken along line 4—4 of FIGURE 3;
FIGURE 5, an enlarged detail view of the anchoring means for the end edges of the bag; and
FIGURE 6, a section taken along line 6—6 of FIGURE 5.

While I have shown only the preferred form of my invention, I wish to have it understood that various changes or modifications may be made within the scope of the claims hereto attached, without departing from the spirit of the invention.
it registers with the rubber strip 7 of the platform when the housing is lowered upon the latter.

The housing also has a metal bar 26 descending from the upper wall thereof, this bar being spaced from and parallel with the heating bar 25. Bar 26 is located with respect to the lower platform to remain substantially rearward of the strip 4 when the housing is lowered, but to bring the anchoring elements carried by its front face immediately over the strip 4 and into registry therewith.

There are four sets of anchoring elements, one for each bag, and one of them is shown in detail in FIGURES 5 and 6.

One of the anchoring elements is in the form of a brace 27 pivoted upon the front face of the bar 26, as at 28, and made to lean sidewise, that is, to the right as viewed from in front, by a pin 29 projecting from the plate, with a spring 30 serving to urge the brace upon the pin 29.

The brace terminates, at its lower end, in a shoe 31, which is secured to the brace by the pin 32, so as to allow of a small amount of pivotal motion of the shoe with respect to the brace. The shoe projects downwardly beyond the bottom edge of the bar 26, and is positioned to bring the shoe directly over the rubber marker 5 of the metal strip 4 when the housing descends upon the platform.

In operation:

When, as the brace descends upon the marker, with the right edge of a bag interposed, the shoe will first rest against the pin 32 and afterwards parallel to the marker.

Next, the brace will swing on the pivot 28 against the spring 30 to lose contact with the pin 29. The right edge of the bag is now firmly anchored with respect to the marker 5 on the strip 4.

It will be noted that in this position, the brace is still capable of a certain amount of swinging motion toward the pin 29, so that, when a pull to the left is exercised on the end of the bracket, the brace, in attempting to swing to the left, will deepen the engagement of the shoe with the bag and will firmly clamp the shoe upon the bag and the latter upon the marker.

At the same time that the shoe clamps upon the right edge of the bag, the roller 33 clamps upon the left edge of the bag. This roller is revolveably mounted upon the front face of the bar 26 by means of a pin 34 in such a manner that its bottom portion is substantially on a level with the bottom edge of the bar, and, as the roller 33 carries a crescent-shaped rib for engagement with the bottom of the bag, the roller is revolveably mounted on a rib with a crescent-shaped rib for engagement with the bottom of the bag.

Thus, as the shoe descends upon the right edge of the bag, the lowermost rubber teeth descend upon the left edge of the bag and firmly clamp the latter edge upon the metal strip 4, the roller and the brace being spaced to correspond substantially to the spacing between the right and left edges of the bag.

The two end edges of the bag are now firmly clamped upon the strip 4, but the intermediate portion of the bag is still loosely resting on the strip, ready to be opened for the withdrawal of the air from the bag by suction and the re-charging of the bag with an inert gas from the inverted channel 8 in the manner previously described.

After the bag has been charged with inert gas or vacuumized, the sealing element 25 is made to descend upon the rubber strip 7 disposed forwardly of the metal strip 4. This sealing element is operated by the diaphragm 18 in the cylinder 17 in the manner described, and while its downward path and before striking the bag, the roller 33 makes its contact with the edge of the bag to partly pull the left edge of the bag away from the right edge and to scratch and smoothen the open end of the bag.

This is accomplished by means of a crank pin 36 projecting from the forward face of the roller and a pair of cleats 37 and 38 projecting from the rear face of the heating element in driving relation to the crank pin. As the sealing element descends, the upper cleat 37 drives the crank pin downward for turning the roller clockwise, and as the sealing element ascends, the lower cleat 38 turns the crank pin back to its original position.

Various operating controls for the machine have not been described in detail, since the invention is particularly directed toward the securing of the bags, the manner of charging the same with nitrogen, and the stretching and smoothing of the bags prior to the sealing operation.

In operation, with the machine in open position:

(1) The operator places the four bags, which have been previously filled, upon the platform, with their open ends facing forward and overlying the metal strip 4 and the rubber strip 7 and their right edges overlying the markers 5 and in line with the white dots 6.

(2) The operator then pushes a switch button which causes the hollow housing to descend upon the platform to form a vacuum chamber therewith.

(3) As the housing descends, the shoe 31 of the brace 27 and the lowermost tooth of the roller 33 descend upon opposite edges of the open bag, and clamp the said edges upon the strip 4. During this operation the shoe 31 rides itself with respect to the upper face of the strip 4 and the brake swings away from the pin to provide a slight clearance. The intermediate portion of the bag remains open, the degree of opening depending upon the bulk of the product within the bag.

(4) Release of the manually operated switch starts evacuation of the chamber.

(5) As the vacuum reaches a desired degree, nitrogen is admitted to the chamber through the channel or tube 8 and the perforations 10 in the form of jets. These jets, in case the two sheets of the bag are too close to prevent an opening, will pass over the upper surface of the upper sheet and produce enough suction on the upper sheet to lift the same and open the bag. This is very important, since, if the nitrogen is fed from any other point of the chamber, there is a tendency for the nitrogen to close the bag and to keep the nitrogen out of the bag.

(6) When the desired nitrogen pressure, still less than atmospheric, has been reached, the pressure operates a valve admitting nitrogen or air at atmospheric pressure to the upper side of the diaphragm 18.

(7) The diaphragm pushes the sealing element 25 downward.

(8) The upper cleats 37 of the heating element bear down upon the roller 36, causing the rollers to turn clockwise. The teeth on the roller pull the left edges of the bags toward the left, that is, away from the shoes 31, thereby tightening the hold of the shoes, and smoothing out the open ends of the bags.

(9) The sealing element descends upon the open ends of the bags, over the rubber strip 7, and heat seals the bags.

(10) After a predetermined time allowed for the sealing operation, the chamber is vented to the atmosphere, the cover is raised and a vacuum is applied to the upper face of the diaphragm to cause the heater bar to return to its initial position.

(11) As the heater bar ascends, the lower cleats 38 act on the crank pins 36 for turning the rollers 33 anticlockwise and back to their original position.

I claim:

1. In a bag sealing machine, a platform adapted to receive an open-ended bag thereon in a predetermined position, a cover movable upon the platform in a predetermined path to form a chamber therewith and a pair of clamping members carried by the cover for clamping opposing edges of the bag end upon the platform as the cover moves upon the latter, one of the members being an inclined brace member for tightening the clamping engagement when pull is exerted on the opposite edge of the bag, and the other member being a roller adapted to exert such pull when rotated.

2. In a bag sealing machine, a platform adapted to re-
ceive an open-ended bag thereon in a predetermined position, a cover movable upon the platform in a predetermined path to form a chamber therewith, and a pair of clamping members carried by the cover for clamping opposing edges of the bag end upon the platform as the cover moves upon the latter, one of the members being an inclined brace operable for tightening the clamping engagement when pull is exerted on the opposite edges of the bag, and the other member being a roller adapted to exert such pull when rotated, with means carried by the cover for rotating said roller after the clamping engagements have been effected.

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