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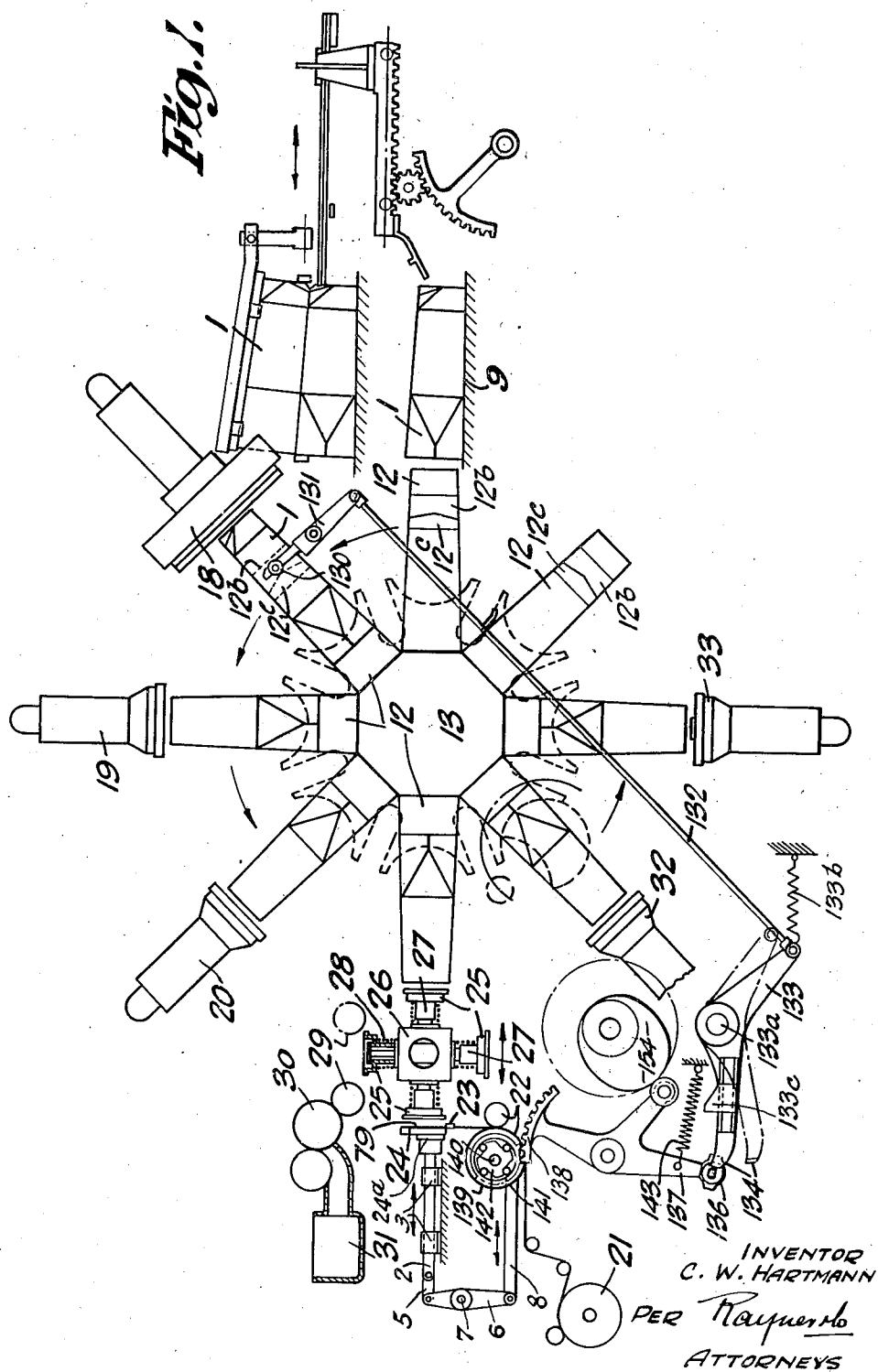
C. W. HARTMANN

2,251,884

MEANS FOR APPLYING SEALING STRIPS, LABELS, OR THE LIKE, TO CARTON ENDS

Filed April 27, 1940

3 Sheets-Sheet 1



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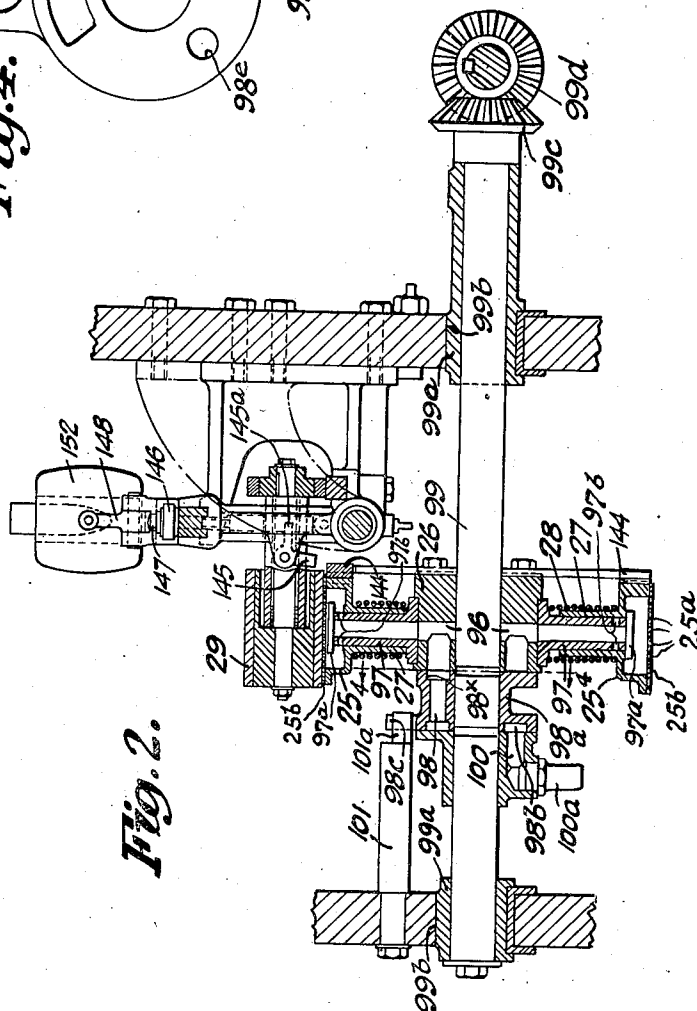
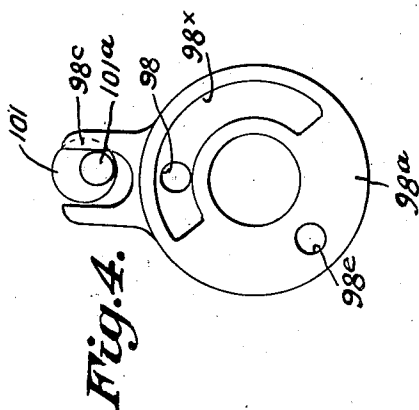
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3 Sheets-Sheet 2



INVENTOR
C. W. HARTMANN
PER *Raymond*
ATTORNEYS

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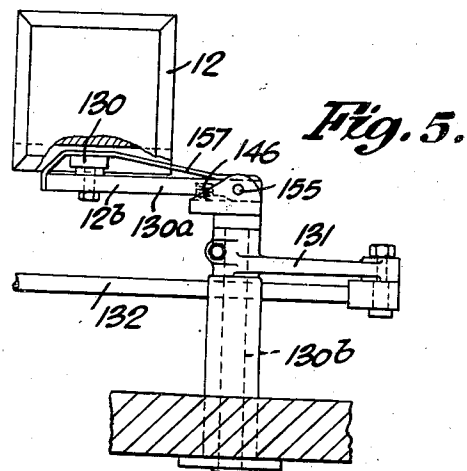
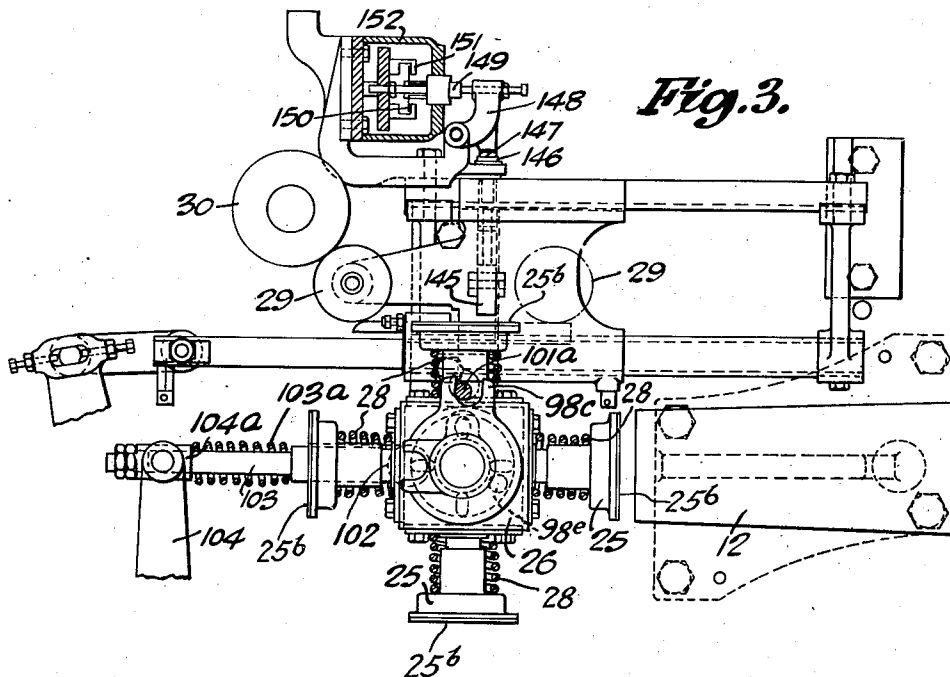
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3 Sheets-Sheet 3



INVENTOR
C. W. HARTMANN

PER *Rayner Ho*
ATTORNEYS

UNITED STATES PATENT OFFICE

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MEANS FOR APPLYING SEALING STRIPS,
LABELS, OR THE LIKE, TO CARTON ENDS

Carl Wilhelm Hartmann, Lyngby, near Copenhagen, Denmark, assignor to Satona Limited, Edinburgh, Scotland

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In Great Britain May 24, 1939

10 Claims. (Cl. 216—25)

This invention relates to an improved method of and means for applying sealing strips, labels or the like to the folded in or closed ends of cartons, and is more particularly intended for use with machines in which tubular section cartons on suitable formers have one end, generally the base, closed by folding and pressing inwards the appropriate end parts of the walls of the cartons to a depth adequate to form an overlapping or "rosette" base, e. g. as described in co-pending application Serial No. 332,033, filed April 27, 1940, now Patent No. 2,238,388, granted April 15, 1941. The object of this invention is to enable labels or other suitable thin flexible sealing strips to be adhered automatically to the closed "rosette" or like ends of cartons as they are carried from the stage where the appropriate ends are folded to the closed position. Another object of this invention is to enable the machine or the label applying means to be stopped automatically when a former which should bear a carton to the label or like applying stage does not carry a carton, so as to avoid labels and the like being adhered to the formers.

In carrying an embodiment of the invention into practice apparatus for applying seals or labels to carton ends comprises means to feed successively seals or labels on to a member connected internally to a source of suction and adapted by reason of the suction to pick up a seal or label and then to be moved from said feeding means towards one of a series of formers each adapted to carry a carton, and to be pressed against the carton on the appropriate former and simultaneously disconnected from the source of suction to deposit the seal or label on the carton, and means with said formers adapted to automatically arrest the seal or label feeding means in the absence of a carton on one of the formers approaching the seal or label applying stage.

In order that this invention may be clearly understood and readily carried into effect drawings are appended hereto illustrating an embodiment thereof and wherein—

Fig. 1 is a diagrammatic side elevation view showing the seal or label applying means combined with means for shaping cartons and closing their bases as a preliminary set of operations in apparatus for feeding the cartons to filling, coating or other mechanisms.

Fig. 2 is an end sectional elevation view of the suction device for transferring the seals or labels to the carton bases.

Fig. 3 is a plan view of Fig. 2 partly in section.

Fig. 4 is an end view on the line 4—4 of Fig. 2, and

Fig. 5 is a detail plan view of a device which automatically functions to cut off the supply of seals or labels to the cartons when one of a series of formers which carry the cartons through the base closing operations does not receive a carton.

Referring to the drawings the seal or label applying apparatus is associated with a set of formers 12 radiating from a common rotary support 13 which is moved intermittently to bring each former 12 into a carton receiving stage opposite a support 9 where opened cartons are pushed on to formers by a reciprocating member 15. The set of formers 12 rotates intermittently in the direction of the arrows shown between some of the formers, and following the delivery of an open ended carton on to the appropriate former, the former next moves into a carton base shaping stage 18 which gives a rosette shape to the base as described in said co-pending application.

Following the base-shaping stage 18 each former carries its carton into two further stages consisting of radially reciprocated presser members 19 and 20 which are suitably heated and are urged against the opposed free end of the appropriate former so as to firmly press the rosette base into a flat condition. When the rosette base of each carton is flattened as above described, a small square or other suitably shaped sealing piece or label is applied thereover, and this sealing label is coated with a suitable adhesive and pressed against the appropriate carton base. The mechanism for carrying out this operation comprises a supply roll 21 for the paper or other material, guide rolls 22 feeding the paper between a cutting bar 23 and a reciprocating knife 24.

The knife 24 is carried by a plate 24a fixed to one end of a rod 2 reciprocating in guides 3, the other end of this rod being connected by a link 5 to a lever 6 oscillated on an axis 7 by a link 8 connected at one end to the lever 6 and at its other end to an oscillated toothed segment 139 hereinafter referred to. The knife presses the severed piece of paper or the like 29 on to the opposed face of one of four suction heads 25 arranged in cruciform manner upon a common rotor 26 connected to a source of suction 100. Each suction head 25 is carried by a sleeve 27 which slides radially relatively to the rotor 26 against the influence of a coiled compression spring 28, this inward sliding movement being effected in the first instance by the pressure of the cutter

24 against the opposed suction head 25, or in the second instance by the pressure of the suction head opposed to the appropriate former 12 to transfer to the base of the carton on the latter former the label 79 picked up from the cutting device, the vacuum or partially vacuum created within each head being maintained between these two stages by reason of the labels sealing the apertures 25a in the plates 25b covering the outer faces of the heads, any reassertion of the springs increasing the suction effort. During the rotation of the suction device a part annular suction passage 92x communicates with three suction heads, a passage 98 connecting this part annular suction passage to an annular passage 98b in permanent communication with the suction conduit 100 terminating in a nipple 100a which receives a flexible suction pipe. The passage 98 and part annular passage 92x are in a non-rotating housing 98a and the rotor 26 has four L-shaped passages 96 which at the appropriate stages register with the part annular suction passage 92x and with an atmospheric pressure port 98e also in the housing 98a the radial limbs of these L-shaped passages being in continuity with four radial tubular arms 97 on which slide the sleeves 27 integral with the heads 25. Flanges 97a at the free ends of the arms 97 limit the outward movements of the heads 25.

The suction effort within each head is maintained until a suction head 25 carrying a label becomes positioned opposite a carton on a former, whereupon such head is pressed against the carton base and during such pressure connection is established between the interior of the head and the port 98e connected to atmospheric pressure. The pressure of each head against the cutter 24 and also against a former carrying a carton is obtained by translatable movement of the rotary set of heads, and this translatable movement effects the inward sliding movements of the heads 25 relative to the rotor 26 against the influence of the springs 28 and such inward sliding movement uncovers ports 97b in the tubular arms 97 thereby completing the connection to suction or atmosphere. For this purpose the rotor 26 carrying the suction heads has imparted to it reciprocating motion transverse to its axis, i. e. horizontally between the cutter 24 and the opposed former in order in one terminal position to pick up the disc or label from the cutting stage and in the other terminal position to press the disc or label against the appropriate carton base. In the latter position the rotor 26 and the suction head opposed to the former occupy relative positions which enables port 98e to be positioned opposite the appropriate passage 96 to break the vacuum within such head.

Advantage is taken of the translatable or reciprocating movement of the rotor to time the movement of opening of the port 98e to coincide with the true axial alignment of the appropriate head 25 and former. For this purpose the housing 98a has just sufficient angular movement imparted to it, as the rotor moves towards the head 12, to raise the port 98e into alignment with the appropriate passage 96. This slight angular movement of the housing 98a about its axis is obtained by engaging in a bifurcated lug 98c on the housing an abutment 101a carried by a bolt 101. The abutment 101a is eccentric in relation to the bolt so that by a partial rotation of the bolt a very fine adjustment of the cut-off and opening stages of the before said port 98e can be obtained. As already explained the rotor 26 is

moved translatively as well as rotated and this translatable movement is effected by sliding the bearing sleeves 99a carrying the shaft 99 in guide slots 99b on a part of the machine frame, for which purpose one of such sleeves has a bolt 102 receiving one end of a link 103 operated from a crank 104 driven from a suitable part of the machine. The bevel pinion 99c gears with a bevel pinion 99d slidable on a splined driving shaft. Each suction head 25 is provided with a plurality of holes 25a arranged in a plate detachably secured by screws. It is preferred to locate a coiled compression spring 103a on the link 103 to absorb some of the axial pressure of the appropriate suction head against the carton head and to connect the crank 104 to the link 103 loosely by collar 104a abutting against the spring.

It is desirable to afford a warning or to stop the machine when no carton is fed on to the appropriate former 12 at the stage 9. For this purpose each former has a transverse channel near its free end which is covered by a carton on the former, but is uncovered so as to be operative when there is no carton on the former. Such channel 12b contains a guide plate 12c along the crested free edge of which (when there is no carton on the former) is adapted to travel a roller 130 on one end of a finger 130a forming a cranked extension of a spindle 130b having a lever 131 which is connected by a rod 132 to one arm of a double-armed lever 133 fulcrumed at 133a. The other end of the lever is formed with a lateral stop 134, which when raised against the influence of a spring 133b by reason of the movement of the said roller 130 in the transverse channel 12b affords an abutment (see Fig. 4) against a pin or roller 136 on the lower end of a rocking lever 137 operated by a cam 154 and carrying at its upper end a segment 138 meshing with a toothed segment 139 on a spindle 140 carrying the paper feeding roller 141. The toothed segment has a uni-directional drive (indicated diagrammatically by the device 142) with the feed roller 141 so that the feed roller is only rotated in the feeding direction. This "stopping" location of the stop 134 prevents a coiled tension spring 143 from reasserting itself to swing the lever 137 in sympathy with the cam 154. The normal or "machine working" position of the stop 134 is shown in broken lines in Fig. 1, and it is held in such position by the spring 133b, a stop plate 133c adjustable on the lever 133 engaging an abutment (not shown) on the machine frame to ensure proper normal location of the levers 131 and 133.

The before said finger 130a forming the cranked extension of the said spindle 130b is free to oscillate against the influence of a spring 146 on a pin 155 having an axis transverse to the axis of the spindle 130b and the outer face of the roller 130 on this finger is partly shielded by a skid strip 157 which slides idly against the appropriate face of the carton on the former, but allows the roller 130 to trip into said channel 12b when there is no carton on the former.

By means of the foregoing mechanism when a former 12 without a carton is on its way to the stage where normally it would receive a label, the roller 130 tripping into the appropriate channel is actuated by the rising crest of the guide plate 12c to operate means to prevent operation of the label cutting and feeding mechanism. At the same time it is desirable to stop the machine in the event of a suction head 25 not receiving a label in the label receiving position and this can

be effected automatically by making use of the upper suction head 25 which has not received a label to operate a switch. By reason of this suction head 25 not having a label it will be extended to a greater radius than if it was under the influence of suction, consequently a cam faced bar 144 on one side thereof will bear against a trigger 145 which has an extended limb 145a adapted to raise a push rod 146 which bears against and raises a round-headed pin 147 against a switch lever 148 which moves inwardly a contact carrying rod 149 carrying a pair of contacts 150 so that this pair of contacts is separated from a fixed pair of contacts 151 in a housing 152 mounted on a suitable part of the machine.

I claim:

1. Means for applying seals on to the ends of cartons comprising a member connected internally to a source of suction, means to feed successively seals on to said member, a series of formers each adapted to receive a carton, said member being adapted by reason of the suction to pick up a seal and then to be moved from said feeding means towards one of the series of formers and to be pressed against the carton on the appropriate former and simultaneously disconnected from the source to deposit the seal on the carton, and means with said formers adapted to automatically arrest the seal feeding means in the absence of a carton on one of the formers approaching the seal applying stage.

2. Means for applying seals on to the ends of cartons comprising a rotor connected internally to a source of suction, a number of radiating tubular members carrying perforated suction heads at their free ends and supported by the rotor, said rotor being connected internally to the tubular members, a rotary ported device adapted to automatically connect and disconnect the tubular members to and from the source of suction, means to reciprocate the rotor transversely to its axis, formers adapted to bring carton ends successively opposite said reciprocating rotor, means to bring said heads successively opposite to the carton ends carried by the formers to press a suction head against a carton end, means to isolate the suction heads from the source of suction when they are moved towards the carton ends, means to feed seals on to the suction heads, and means with said formers adapted to automatically arrest the seal feeding means in the absence of a carton on one of the formers approaching the seal applying stage.

3. Means for applying seals on to the ends of cartons comprising a rotor connected internally to a source of suction, a number of radiating tubular members carrying perforated suction heads at their free ends and supported by the rotor, said rotor being connected internally to the tubular members, a rotary ported device adapted to automatically connect and disconnect the tubular members to and from the source of suction, means to reciprocate the rotor transversely to its axis, formers adapted to bring carton ends successively opposite said reciprocating rotor, means to bring said heads successively opposite to the carton ends carried by the formers to press a suction head against a carton end, said heads being slidably supported by said tubular members, spring means yieldingly opposing inward sliding movement of said heads relatively to the tubular members due to the suction effort so that when the suction is cut off at the appropriate tubular member the spring means thereof reasserts itself and presses the seal against the

carton end, means to isolate the suction heads from the source of suction when they are moved towards the carton ends, means to feed seals on to the suction heads, and means with said formers adapted to automatically arrest the seal feeding means in the absence of a carton on one of the formers approaching the seal applying stage.

4. Means for applying seals on the ends of cartons according to claim 7 wherein said channel is shaped to act as a cam upon said lever.

5. Means for applying seals on to the ends of cartons comprising supporting devices for the cartons, a combined pressing and suction head adapted to press labels on to cartons on the said supporting devices, means to connect the head to a source of suction, means to feed a seal to the head when thus connected to the source of suction, means isolating the head from the source of suction when it is pressing a seal on to a carton on one of said supporting devices and means arresting the feed of seals when a supporting device approaching the head is without a carton.

6. Means for applying seals on to the ends of cartons comprising formers adapted to have fitted thereon the cartons to receive seals, seal applying means opposite which the carton carrying formers are located in succession, said seal applying means comprising a head shaped to carry a seal and means to press the seal carrying head against the appropriate former to transfer the seal to the appropriate carton, means preventing transfer of a seal to any former that passes from the carton receiving stage without receiving a carton and comprising driving means with each former and adapted to be covered and rendered inoperative by the location of a carton on the appropriate former, driven means actuated by said driving means, operating means to impart label applying pressure to said seal applying means, a stop adapted to arrest operative movement of said operating means of the seal applying means, and means normally holding said stop in an inoperative position, said stop being moved into a "stopping" position through the medium of said driven means actuated by said driving means associated with the formers.

7. Means for applying seals on to the ends of cartons comprising formers adapted to have fitted thereon the cartons to receive seals, seal applying means opposite which the carton carrying formers are located in succession, said seal applying means comprising a head shaped to carry a seal and means to press the seal carrying head against the appropriate former to transfer the seal to the appropriate carton, means preventing transfer of a seal to any former that passes from the carton receiving stage without receiving a carton and comprising a transverse channel across one face of each former, the said channel being adapted to be covered by the cartons so as normally to be inoperative, operating means to impart label applying pressure movements to the seal applying means, a spring loaded actuating lever with a part adapted to enter and traverse said channel and to be actuated by said channel in the absence of a carton on the appropriate former, a stop operatively connected to said lever and adapted to arrest operative movement of the said operating means of the seal applying means, and means normally holding said stop out of the path of movement of the operating means which transmits pressure applying movements to the seal applying device, said stop being moved by

said lever into a position to impede the said transmission of movements when said lever part enters the said transverse channel.

8. Apparatus for applying seals on to the ends of cartons comprising formers adapted to receive the cartons to be fitted with seals, a device adapted to apply seals by pressure to the cartons on the formers, means to feed the seals to the said device, said formers being adapted to convey cartons in succession opposite to said seal applying device, means preventing the transfer of seals to the seal applying device when a former approaches the seal applying device without a carton, and means adapted to stop the operation of the apparatus when the seal feeding means fails to transfer a seal to the seal applying device.

9. Means for applying seals on to the ends of cartons comprising a rotor connected internally to a source of suction, a number of tubular members radiating from said rotor, perforated suction heads slidably supported by said tubular members, means to feed seals to the suction heads, said rotor being connected internally to the tubular members, a rotary ported device adapted to connect and disconnect the tubular members to and from the source of suction, formers adapted to bring carton ends successively opposite said rotor, means to bring said heads successively opposite to the carton ends carried by the formers, means to reciprocate the rotor to press the appropriate suction head against a carton end and also to press each suction head

in turn to a seal receiving position, spring means yieldingly opposing inward sliding movement of said heads relatively to the tubular members due to said pressure, and ports opened by the inward movements of the suction heads relatively to said tubular members to connect the heads to the source of suction when receiving labels and to atmosphere pressure when being pressed against a carton end.

10. In apparatus for applying seals to cartons a series of formers each adapted to receive a carton, a suction head connected internally to a source of suction, means to apply seals in succession to said head whereby the seals are held upon the head by suction, means to align the seal carrying suction head with a carton end on one of said formers, means to press the head and a former together and to simultaneously break the vacuum in the suction head to apply the seal to the carton end, an abutment, means to stop the working of the apparatus actuated from said abutment, said abutment being adapted to be engaged and displaced from a normal position by reason of the suction head not carrying a seal to the applying zone for the purpose of transmitting operative movement to said means adapted to stop the apparatus, said abutment being so located that normally it is missed by a suction head carrying a seal by reason of the inward retraction of the head due to suction.

CARL WILHELM HARTMANN.