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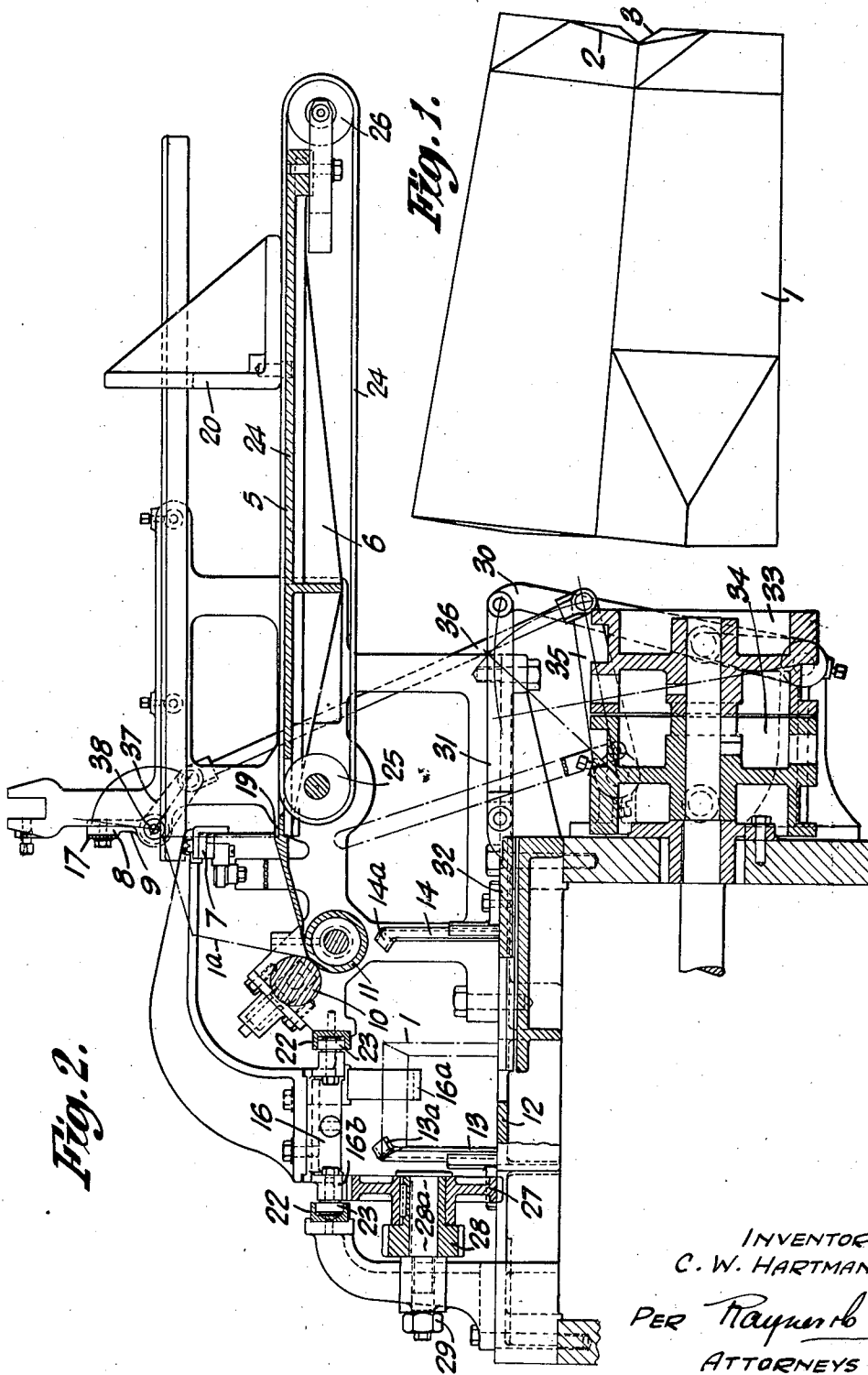
C. W. HARTMANN

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MEANS FOR ERECTING CARTONS

Filed April 27, 1940

2 Sheets-Sheet 1



INVENTOR
C. W. HARTMANN
PER *Raymond*
ATTORNEYS

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2 Sheets-Sheet 2

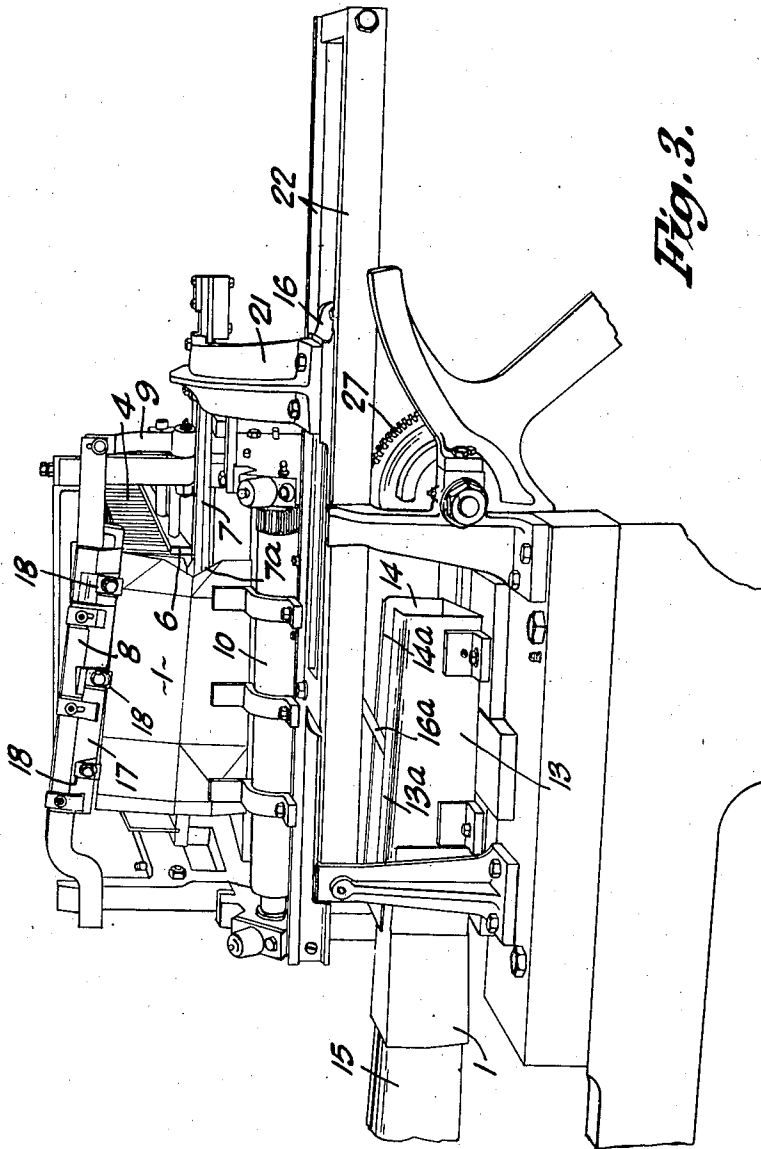


Fig. 3.

INVENTOR
C. W. HARTMANN
PER *Rayner*
ATTORNEYS

UNITED STATES PATENT OFFICE

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MEANS FOR ERECTING CARTONS

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

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5 Claims. (Cl. 93—53)

This invention relates to machines for treating or filling cartons and is more particularly concerned with mechanism for feeding cartons from a stack on to means for closing the bases of the cartons as a preliminary to filling or treating the cartons, the "treating" for example consisting in impregnating the cartons with wax. The object of this invention is to enable cartons in flattened tubular form precreased for distending into the desired tubular cross section (e. g. square section) to be delivered in rapid succession from a stack or magazine, distended and fed on to suitable shaping means.

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 face view of a flattened carton blank of the type which is particularly suitable for treatment with the present invention.

Fig. 2 is a sectional end elevation view of the carton feeding mechanism.

Fig. 3 is a front elevation view.

Referring to the drawings the preferred form of carton for use with the apparatus is shown in Fig. 1 and is in use for retailing liquids. It comprises a cardboard or like blank 1 folded into a square section tube with downwardly converging sides, and an unfolded base end provided in one corner with a wide V-notch 2 and in the diagonally opposite corner with a narrow V-notch 3. The pile of blanks is stacked in such manner that the notches are arranged in a line midway between the upper and lower corners of the flattened tubular carton elements, the blank shown in Fig. 1 being the view of the front carton of a stack in which it will be seen that the narrower notch 3 is in rear of each flattened carton tube.

The stack 4 of cartons is supported on the base 5 of a suitable frame 6 which has combined with it mechanism for initially distending each carton into tubular form, such means including a spreader bar 7 which is engaged inside each flattened carton so as to locate one of the four walls of the square section carton firmly against the stack of cartons. Engaging the upper edge of the leading carton is a folding bar 8 which is carried across a pair of swinging arms 9 which traverse the folding bar into an arcuate path forwardly whilst still engaging the same edge of the carton, and the result of this is to nearly open the carton to square tubular section so that it has a parallelogram or rhomboid cross section as indicated by the broken lines 1a. The movements imparted to the carton by the combination of the

spreader bar 7 and folding bar 8 presents one corner of the carton to the space adjacent to the converging sides of two rollers 10 and 11 having roughened peripheries and which draw the carton between them and deliver it on to a shaping plate 12 provided at one end with a fixed but adjustable abutment plate 13, and at the other end with a pusher plate 14 which is reciprocated so as to be in rear of each carton as it falls on to the shaping plate 12, whereupon the pusher plate 14 engages the adjacent edge of the carton and presses it towards the fixed abutment plate 13 so as to bring the carton into square section configuration. The carton is now of tubular form and open at both ends, the larger area end adapted to comprise the top being presented towards and in axial alignment with one of a number of formers 15, on which the bases of the cartons are closed and sealed, these formers being of square section and radiating symmetrically from a rotary support. At this stage the tubular carton is pressed on to the aligned former 15, this being effected by means of a sliding carriage 16 which is moved in unison with the spreader bar, and carries a finger-piece 16a adapted to engage over the upper horizontal edge of the open base end of the carton and to press the carton mouth end foremost on to the appropriate former 15.

The folding bar does not actually engage the cartons but carries a relatively adjustable longitudinal blade 17 having a bevelled lower edge, which in the uppermost position is parallel with and very slightly overlaps the inner side of the upper edge of the foremost carton. Combined with this blade are a number of stops in the form of substantially square metal pieces 18 which slightly overlap the front side of the foremost carton and co-operate with a raised step 19 on the front end of the base plate 5 on which the stack of cartons are supported, to form abutments opposing the forward pressure of a feeding plate 20 at predetermined stages in the sequence of operations. The feeding plate 20 engages the rear-most of the stack of cartons. The blade 17 may be a flexible strip, e. g. rubber or thin metal, and the pieces 18 can be packed to the desired spacing by shims or pieces of paper.

The spreader bar 7 is adapted to engage inside each carton in turn and it is carried by the free end of a bent arm 21 fixed to the beforesaid carriage 16 which reciprocates horizontally in guide rails 22, rollers 23 affording the requisite supporting means for the carriage. The extent of reciprocation of the spreader bar 7 and its carriage is predetermined so as to ensure that in

the rearmost position of the spreader bar its front end 7a which is chisel pointed does not quite leave the base end of the appropriate carton, this front end having a rear terminal position which just clears the apex of the wide V 2 of the carton whereby in the rearmost position of the spreader bar 7 immediately a carton is delivered to the said roughened rollers 10 and 11 the next carton in succession is fed forwardly by the feeding plate 20 and its wide V 2 clears the pointed end of the spreader bar 7, and the spreader bar 7 can now move forwardly to engage fully within the foremost carton.

The movements of the folding bar 8 and the spreader bar 7 are regulated in such manner that as the folding bar 8 swings forwardly downwardly, the spreader bar 7 is fully engaged within the carton engaged by the folding bar, and this results in the lower rear wall part of the carton blank being held flush against the stack of cartons and the remaining three walls folded in a somewhat parallel link manner relatively thereto until the corner of the carton aligned with the apex of the wide V is engaged between the said rollers 10 and 11. At this stage the folding bar swings backwards to present its abutments 18 against the upper edge of the foremost carton of the blank and to trip the said blade 17 of the folding bar over such edge. Immediately following this operation the spreader bar is retracted and the rotation of the said rollers will draw the already delivered carton away from the stack, the narrow V 3 passing over the pointed front end of the spreader bar. The spreader bar 7 immediately moves forwardly and engages in the next carton in succession ready for repeating the operation.

The said rollers 10 and 11 have milled or roughened peripheries to ensure adequate gripping action on the cartons and to deliver them positively on to the shaping plate 12. The feeding plate 20 is urged forwardly by a frictional drive on an endless belt 24 passed over a pair of rollers 25 and 26 one of which is driven slowly by any suitable means. The sliding carriage 16 carrying the spreader bar 7 is reciprocated by engaging a rack bar 16b thereon with a gear wheel 27 fixed to a further gear wheel 28 which is fixed to a spindle 28 rotating in a bearing 29, the gear wheel 28 being driven by a reciprocating segment operated from a suitable driving part of the machine. The pusher plate 14 acting upon the shaping plate 12 can be reciprocated by an oscillating lever 30 connected by a link 31 to a slide 32 carrying the pusher plate. The lever 30 can be operated from a cam grooved drum 33, disposed alongside another cam grooved drum 34 which imparts oscillation to a lever 35 which is connected by a link 36 to a lever 37 fixed to a spindle 38 carrying the swinging arms 9 of the folding bar 8.

The pusher plate 14 is a buffer member shaped to engage the full side of a carton, and the before-said abutment 13 is also a correspondingly shaped buffer plate, the upper edges of these plates being bent inwardly as at 13a and 14a to fit over the adjacent corner of each carton thereby ensuring a firm support of the carton when the plate 14 reaches its foremost position. Up to this stage the carton is embraced between the pair of plates 13 and 14 and is firmly supported for substantially its full length, and the next operation is as before-said to push the carton endwise by the finger 16a on to the appropriate former, it being apparent that the finger 16a

is adapted to slide between the opposed free edges of the inwardly directed parts of the said plates 13 and 14.

I claim:

1. In mechanism for squaring out collapsed tubular carton blanks with four side panels and for feeding them on to a former, abutments between which the carton blanks are brought to open square tubular form, means varying the separation between said abutments, means feeding the carton blanks in substantially flattened form between the abutments during the widest separation of the abutments, and means to push the cartons from between said abutments on to the former during the minimum separation stage of said abutments.

2. Mechanism for squaring out collapsed carton blanks comprising a support for a stack of flattened carton blanks, a pair of feeding rollers adapted to receive between them a leading corner of each carton from the stack, means operating independently of the rollers to feed the cartons successively from the stack to said roller, abutments against one of which the said leading corner of each carton is impelled by said rollers, and means to vary the separation between some of the said abutments to fold the blanks issuing from said rollers from flattened to open box-like form.

3. Mechanism for squaring out collapsed carton blanks comprising a support for a stack of flattened carton blanks, a pair of feeding rollers adapted to receive between them a leading corner of each carton from the stack, means operating independently of the rollers to feed the cartons successively from the stack to said rollers, abutments against one of which the said leading corner of each carton is impelled by said rollers, means to vary the separation between some of the said abutments to fold the blanks issuing from said rollers from flattened to open box-like form, a former, and a reciprocating carton pushing member adapted to engage one end of the open carton between the abutments and to push it on to the former.

4. In combination with mechanism for squaring out carton blanks, a support for a stack of carton blanks, a pair of feeding rollers adapted to feed the cartons to the squaring out means, a reciprocating bar moving across the leading end of said stack so as to engage one side of the leading carton blank to form a temporary stop for such side, an oscillating abutment operating independently of said rollers adapted to engage a corner of the leading carton and to open out the leading carton so as to press another edge of the blank in between said rollers so that the whole of each carton is traversed between the rollers to the squaring out means.

5. Means for use in carton shaping machines for feeding flattened tubular cartons singly in succession from a stack to the mechanism for shaping the cartons comprising a reciprocating abutment adapted to be successively engaged with the interiors of the cartons against a predetermined side of each carton, so as to form a temporary stop against the inner side on one wall of each carton, and a co-operating abutment moving transversely relatively to the before-said abutment and engaging an edge of each carton to displace such edge in a direction appropriate to a partial distending of the appropriate carton relatively to said abutment, a base member, a pair of feeding rollers adapted to receive a leading corner of each such partially distended carton

and deliver the carton on to said base member
formers adapted to receive cartons, a parallel
pair of abutment plates on and perpendicular to
said base member between which the cartons are
fed individually successively, means to vary the
separation of said plates for bringing the cartons

5 to open tubular form, and a reciprocating pusher
member operating between said pair of plates
and adapted to engage the rear end of each carton
and to push the cartons from between said plates
on to a former.

CARL WILHELM HARTMANN.