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MECHANISM FOR FEEDING CARDBOARD AND LIKE BLANKS TO
CREASING, SLOTTING, FOLDING OR OTHER
TREATING MACHINERY
Filed July 24, 1961

3,105,681

Fig. 1.

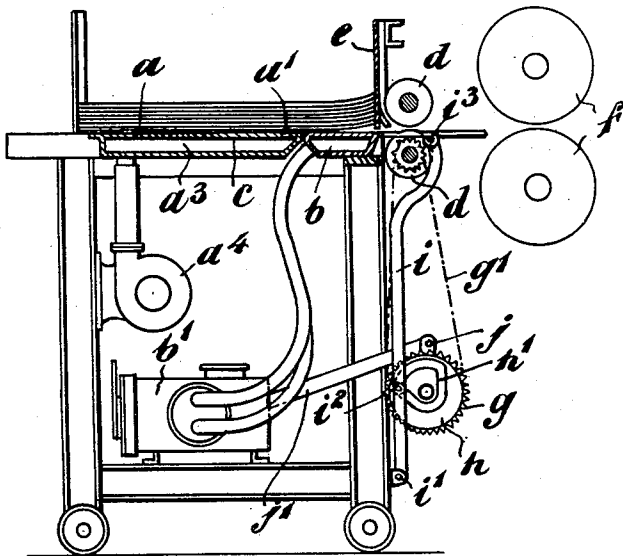
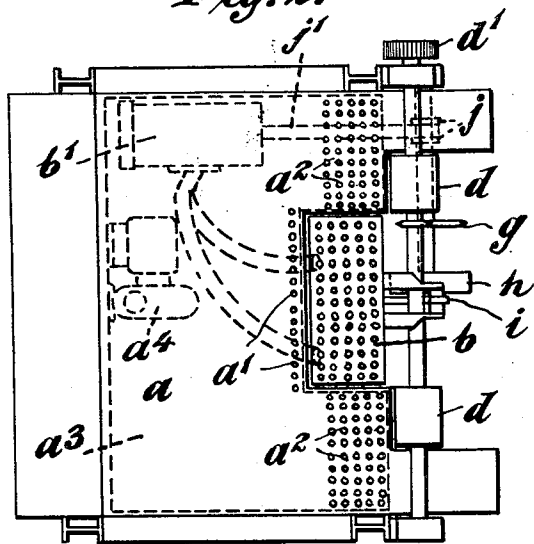


Fig. 2.



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MECHANISM FOR FEEDING CARDBOARD AND LIKE BLANKS TO CREASING, SLOTTING, FOLDING OR OTHER TREATING MACHINERY

Thomas Desmond Bishop, Solihull, England, and Edwin Leslie Bishop, deceased, late of Barnt Green, England, by Gwendolin Alice Bishop, Barnt Green, and Hazel Sheila Ray Cheafle, Birmingham, England, executors, assignors to The Deritend Engineering Company Limited, Birmingham, England

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3 Claims. (Cl. 271—32)

This invention relates in general to apparatus for feeding cardboard or like blanks to creasing, folding, or other treating machinery, and, in particular, to machines for automatically feeding such blanks from the bottom of a pile.

This operation has been effected in the past by a displaceable suction cup which engaged the lowermost blank and fed it into the nip of the feed rolls. However, when the board is warped sufficiently the suction of the feed mechanism is not sufficient to engage the lowermost blank and accordingly the blank would not be pulled from the bottom of the pile.

Thus, it is an object of this invention to provide improved blank feeding means.

It is a further object of this invention to provide an improved blank feeding means which may automatically feed blanks one by one from the bottom of a pile even though normal warping, bending, or deformation may have occurred in one or more of the blanks.

The present invention features mechanism for feeding cardboard and like blanks to creasing, slotting, folding or other treating machinery wherein one, two or more openings or cavities are provided in the table supporting the pile of blanks, adjacent their forward part through which a pre-suction or negative pressure is applied by suitable suction means such as a motor and fan. This pre-suction is operative not only to pull the forepart of the lowermost blank downwardly substantially throughout its width but also into engagement with a reciprocatory suction feed cup, the vacuum of which is subsequently applied. The vacuum of the feed cup may be increasingly built up by the stroke of a piston therein, the pre-suction of the table openings tending to hold the lowermost blank down onto the reciprocatory cup until it is efficiently passed to and received by the feed rollers.

Other objects, advantages, and features will become readily apparent when the following description is taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a side elevation, partly in section, of the table for supporting the stack of blanks showing the movable suction cup and low pressure suction chamber and slightly distorted blanks; and

FIG. 2 illustrates in plan the table, movable suction cup and low pressure suction areas.

Referring to the drawings there is shown an embodiment of the invention in which there is provided at the forepart of the table *a*, upon which the pile of blanks are placed, openings *a*¹, *a*² which are connected to a pre-suction source comprising a chamber *a*³ covering the underside of the table *a* connected to a suction fan *a*⁴. This presuction vacuum may be continuous or intermittent and is or may be completely independent of the second suction source *b*¹ of the movable suction cup *b*. The pre-suction vacuum through openings *a*¹, *a*² pulls the bottom of blank *c* onto the suction cup *b* before its suction takes effect.

When the blanks are slightly curved or bent, and this often happens, the center portion of the forepart of the

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lowermost blank *c* may be slightly clear of the traversable suction cup *b*. In this invention, however, the entire forepart of the blank *c* is pulled down onto the table by the pre-suction areas *a*¹, *a*², and this materially assists the engagement of the center part of the blank *c* with the traversable suction cup *b*. The suction cup *b* is traversed to bring the lower blank into engagement with the feed rollers *d*. It will be appreciated that during this operation the suction on the remainder of the blank, through apertures *a*¹, *a*², is continuous up to the feed rolls *d* so that the leading edge of the lower board of the pile is held in a flat condition during its passage to the said feed rollers *d*. The suction cup apparatus *b* comprises a traversable suction device effected by a vacuum which may be provided by a piston of a suction motor moving outwardly until the piston reaches a relief port in the cylinder wall (or it may be effected by other equivalent mechanism). Simultaneously, with this continued motion of the piston the suction cup member *b* is traversed forwardly to feed the lower blank *c* into the feed rollers *d*. Prior to this operation the blank is subjected to the pre-suction operation along its front part by the apertures *a*¹, *a*². In this manner the mechanism can be speeded up inasmuch as there is no fear of a distorted blank stopping the mechanism. A multiple of holes, or a long continuous cavity or cavities if desired, may be provided on each side of the traversable suction device *b* and/or at the rear of it through which air is drawn, and the actual holes may be elongated, coned or formed in any desired manner to obtain the most efficient co-operation with the lower board of the pile. In the drawing *e* is the usual stop plate and *f* may be creasing, slotting or other mechanism for the treatment of the board.

The feed rolls *d* are geared together at *d*¹ and are driven from a suitable power source. A chain *g*¹ gears the feed rolls *d* with the sprocket *g* on the shaft of which there is mounted a disc *h* having a cam groove *h*¹. A lever *i* is pivoted at *i*¹ and operatively connected at *i*² to the cam groove *h*¹ so that its upper extremity *i*³ reciprocates suction cup *b*. The suction cup *b* derives suction from the pump *b*¹ which in turn is operated by the crank *j* on the cam shaft with connecting rod *j*¹.

It is to be appreciated that the low pressure suction from the apertures *a*¹, *a*² is preferably continuous. It is also to be appreciated that the suction exerted by suction cup *b* is higher allowing the suction cup *b* to feed the bottom blank *c* forward in spite of the effect of the pre-suction apertures *a*¹, *a*². The boards slide over the apertures *a*¹, *a*². The suction from the apertures *a*¹, *a*² naturally takes effect prior to the suction cup *b*. After the return movement of cup *b*, sudden suction may be applied when ready for its forward stroke. If desired the low pressure suction from apertures *a*¹, *a*² may be intermittent, but it must precede the suction of the intermittently actuated suction cup *b*.

We claim:

1. Mechanism for feeding cardboard or like blanks to creasing, slotting, folding or other treating machinery, comprising; first suction means, a table for supporting the blanks having provided therein a plurality of openings or cavities adjacent the forward parts of the blanks through which a pre-suction or negative pressure of a first degree is applied by said first suction means; said pre-suction being operative to pull the forepart of the lowermost blank downwardly substantially throughout its width; and a reciprocatory suction feed cup for engaging the blank and applying to the blank a suction or negative pressure of a second degree which is greater than said first degree after said pre-suction operation, said openings or cavities for the negative pressure being arranged in the

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table on each side of and behind the starting position of the reciprocatory suction feed cup.

2. Mechanism as claimed in claim 1, wherein the pre-suction or negative pressure is continuous as distinct from the negative pressure in the reciprocatory suction feed cup which is intermittent. 5

3. Mechanism as claimed in claim 1 wherein the pre-suction or negative pressure openings in the table connect with a chamber covering the underside of the table, and a suction fan connected to said chamber. 10

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