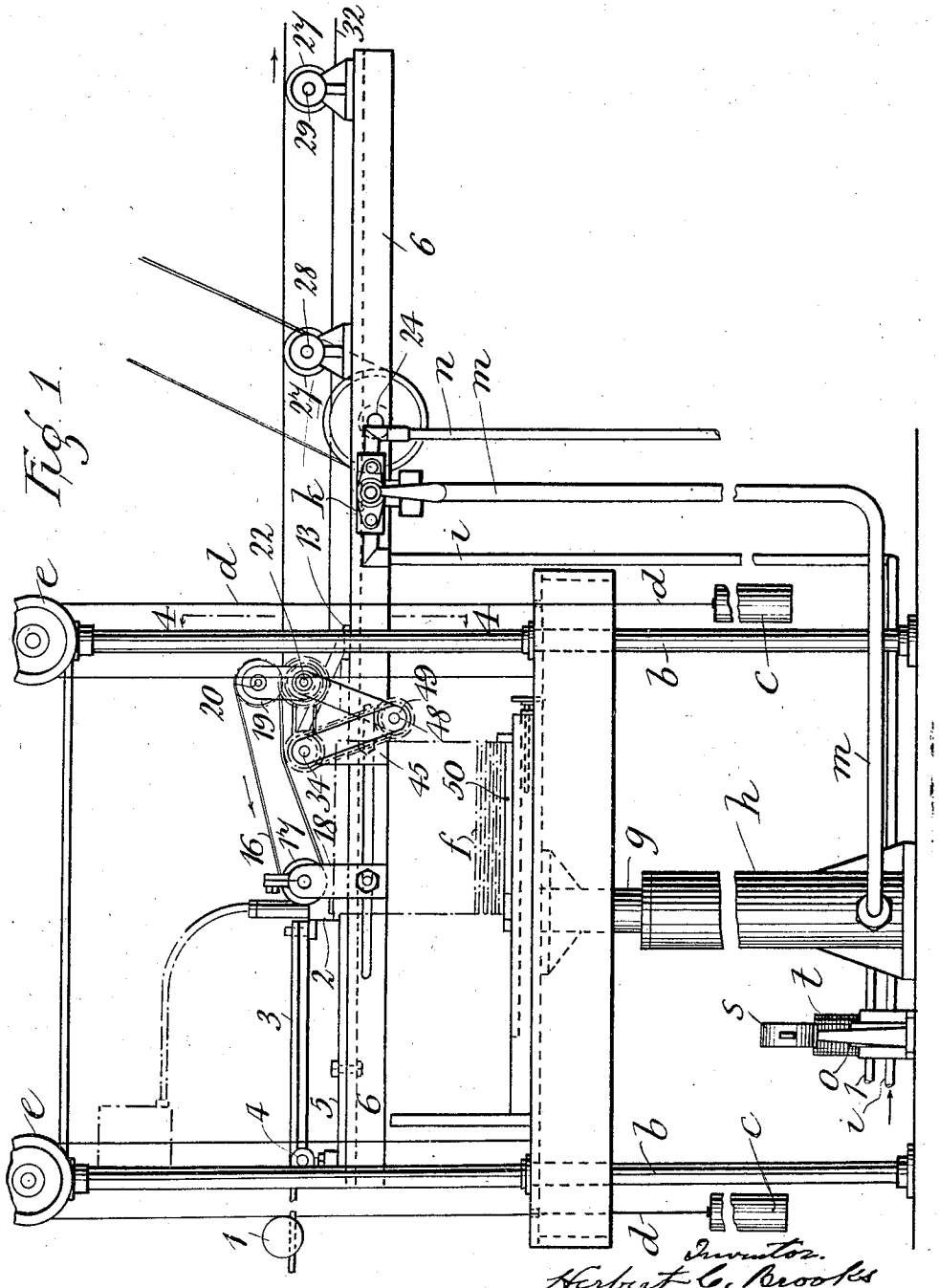
Oct. 23, 1923. 1,471,722

H. C. BROOKS

MACHINE FOR APPLYING ADHESIVE MEDIUM TO ENVELOPES, WRAPPERS, AND THE LIKE

Original Filed Oct. 4, 1920 5 Sheets-Sheet 1

Fig. 1.



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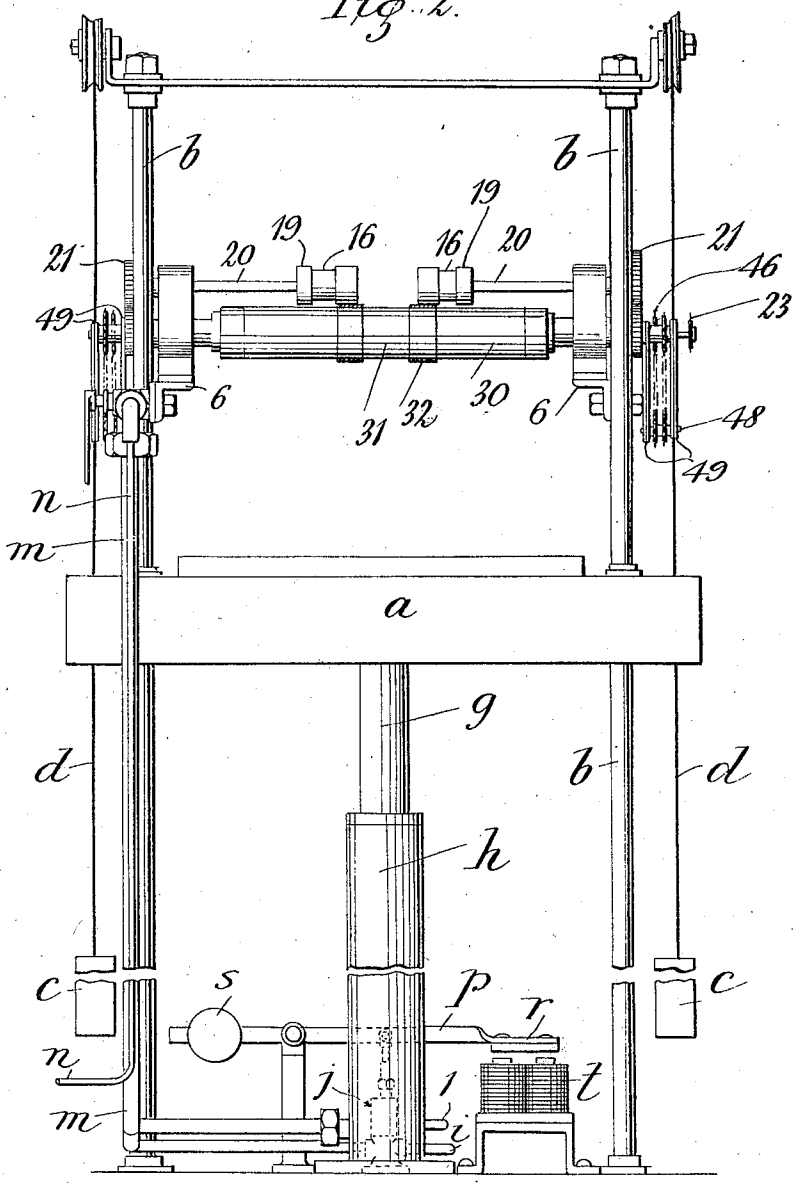
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Fig. 2.



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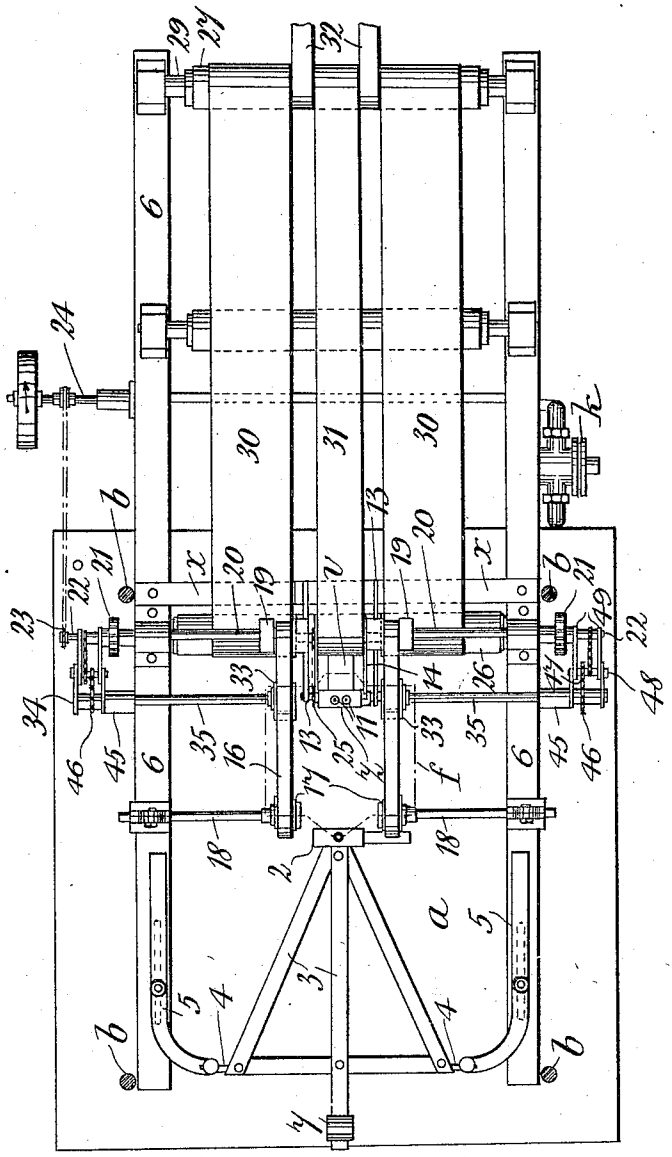
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Fig. 3.



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Fig. 4.

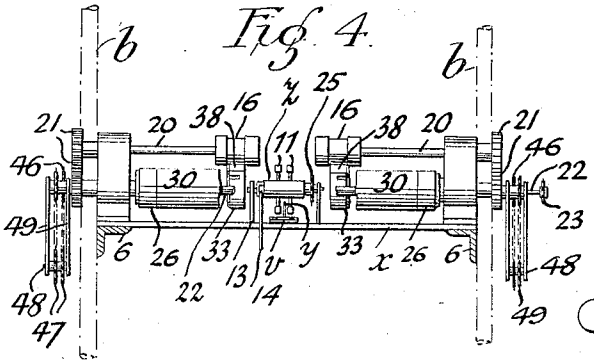


Fig. 4a

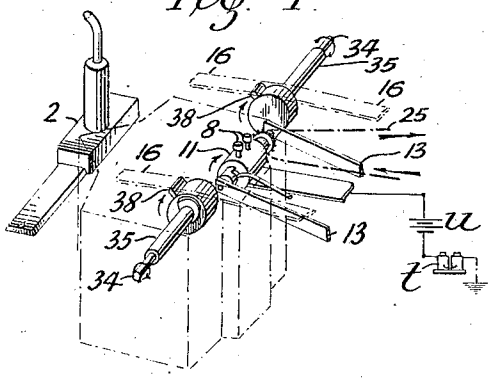


Fig. 7.

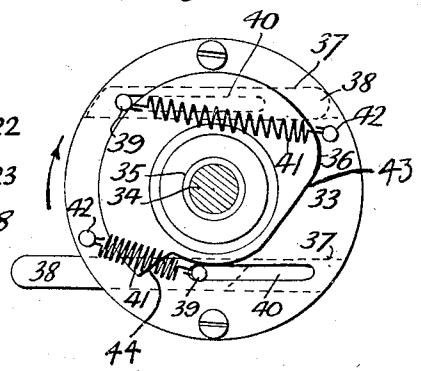


Fig. 8

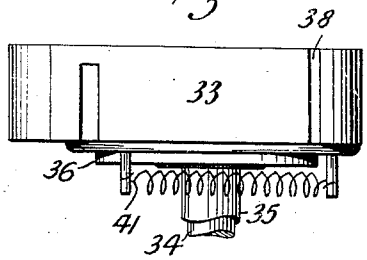


Fig. 9.

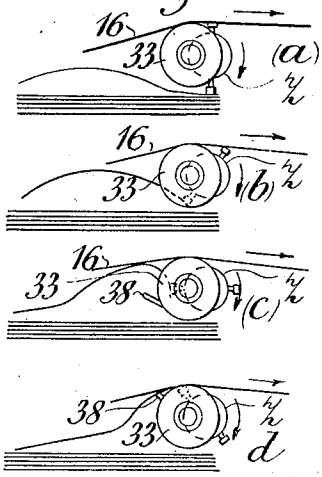
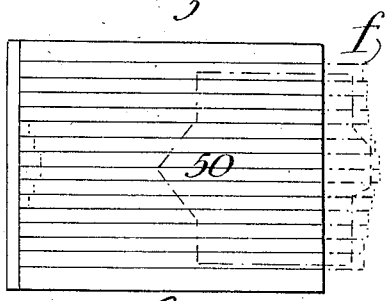


Fig. 10.



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Fig. 5.

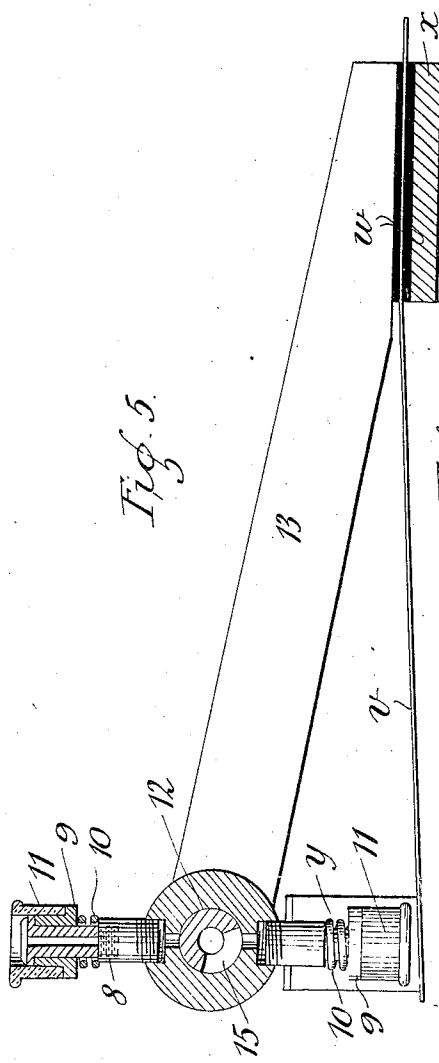
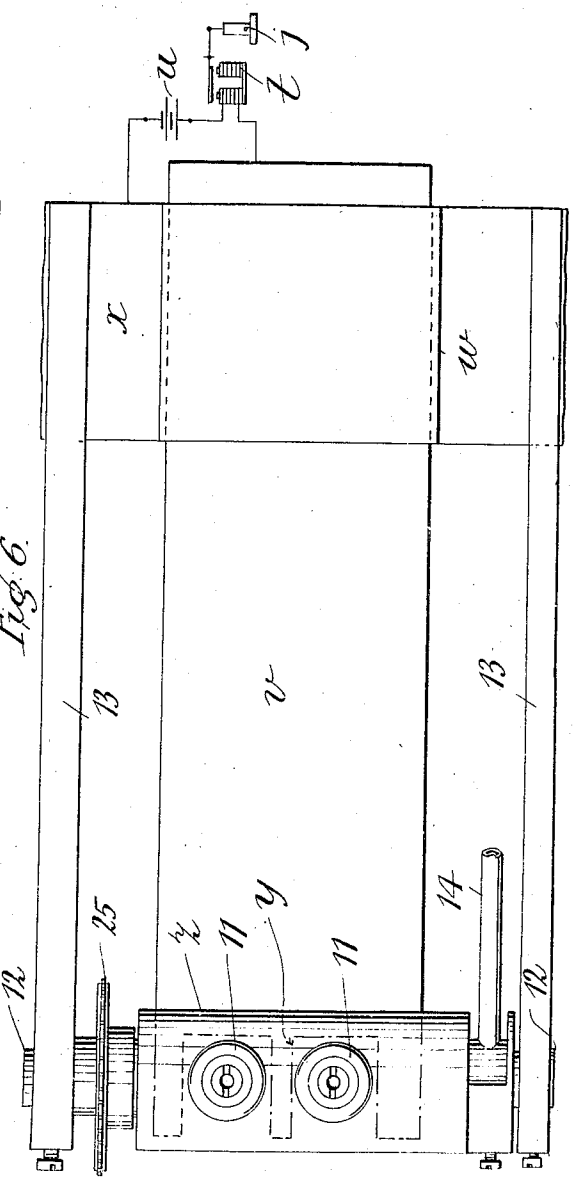


Fig. 6.



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Patented Oct. 23, 1923. 1,471,722

UNITED STATES PATENT OFFICE.

HERBERT CHARLES BROOKS, OF CLAPHAM, LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO HAROLD FRANK WARBEY, OF HIGHFIELD, ESHER, SURREY, ENGLAND.

MACHINE FOR APPLYING ADHESIVE MEDIUM TO ENVELOPES, WRAPPERS, AND THE LIKE.

Application filed October 4, 1920, Serial No. 414,569. Renewed February 6, 1923.

To all whom it may concern:

Be it known that I, HERBERT CHARLES BROOKS, a subject of the King of Great Britain and Ireland, residing at Clapham, London, England, have invented Improvements in Machines for Applying Adhesive Medium to Envelopes, Wrappers, and the like, of which the following is a specification.

This invention relates to machines of the kind in which the individual blanks of a pile of enevelope blanks or the like, destined to be gummed by a shaped gummer, are successively dislodged by suction devices and delivered to a conveyor.

Heretofore arrangements of this kind have necessitated complete removal of one blank from the pile, however arranged, before the suction device can act to engage and dislodge another blank so that the process is relatively slow.

The object of the present invention which has a correspondingly wide application is to enable operations to proceed at greater speed and with a minimum of attention, to which end it is arranged that the suction device or devices shall rotate adjacent to the end of the pile of blanks to be dealt with, in a manner such that the individual blanks are first urged in a direction opposite to that in which they are ultimately to be conveyed, with the result that each blank is appreciably buckled whilst held at the gummer and thus promptly brought into contact with the gripping means for removing same, it being unnecessary to wait until one blank is entirely clear of the pile before the next blank can be dislodged.

A further feature of the invention consists is supporting the pile of blanks upon a table adapted to rise under the action of means controlled electro-magnetically through a switch in accordance with the diminishing height of the pile. The suction devices, also, for dislodging the individual blanks of the pile are carried by a drum revolving about a stationary hollow ported shaft, the interior of which is being continuously exhausted, the suction devices being thus rendered operative during a portion of a revolution of the drum.

But in order that the invention may be more readily understood it will now be further described with reference to one constructional example illustrated in the accompanying drawings whereof Figs. 1 and 2 are elevations at right angles to one another of the machine complete. Fig. 3 is a plan view of the same with parts removed. Fig. 4 is an elevation of parts of the machine to the left of the line 4—4 Fig. 1. Fig. 4ª is a perspective view of part of Fig. 4. Figs. 5 and 6 are respectively a sectional elevation and plan to a larger scale of details hereinafter referred to. Figs. 7 and 8 are views similar to Figs. 5 and 6 of other details. Fig. 9 is a set of diagrams added to illustrate the mode of removing a blank from the pile to be gummed. Fig. 10 is a plan of a detail modification.

As here shown, a table *a* is mounted to slide vertically upon guide pillars *b*, such table being partially counterbalanced by weights *c* at the end of flexible connections *d* passing over sheaves *e*. The table *a* carries the pile of blanks *f* and is caused to rise in accordance with the diminishing size of the pile by any suitable means controlled electromagnetically through a switch, one member whereof rests upon the top of the pile which is thus maintained at substantially one predetermined level. In the example such table-raising means comprises a ram *g*, the cylinder *h* whereof is adapted to be supplied with water from any convenient source, here assumed to be derived from an ordinary service main through a pipe *i* provided with a valve *j* and shown as extending to a cock *k* whereby it can be placed in communication with a pipe *m* for admission to the cylinder *h*, such cock in another position serving to place the pipe *m* in communication with a discharge pipe *n* when it is desired to exhaust the cylinder and allow the table *a* to descend. The stem *o* of the valve *j* which has only a minuate movement, is pivotally connected to a lever *p* provided with an armature *r* and with a counterbalancing weight *s*, the said armature being associated with an electromagnet *t* shown diagrammatically in Figs. 5 and 6 as in circuit with a battery *u* one pole whereof is connected to a resilient blade *v* carried by an insulator *w* (Fig. 5) from a cross stay *x* of the machine. This blade, which bears upon the top of the pile of blanks, carries a contact *y* adapted to engage some part of the machine, in this

case a drum z, when the top of the pile is at the predetermined level required so that the circuit of the electromagnet t is complete to earth, at which time the electromagnet is energized and acts to close the valve j thereby arresting ascent of the table a. Removal of a blank from the pile however causes the contact y to open the circuit, de-energize the electromagnet and permit the valve j to admit sufficient water to the cylinder to raise the pile until the circuit is again completed whereupon the table is once more arrested. The intermittent movement of the table, as will be apparent, is hardly distinguishable, the cycle of operations being very rapid and the general progress of the table relatively slow. To initially adjust the position of the table with rapidity an auxiliary inlet pipe is shown at 1, through which water can be freely supplied to the cylinder when desired.

The gumming device, which, as already stated, forms no part per se of the present invention is shown at 2, being carried by a triangular frame 3 pivoted at 4 within adjustable bracket bearings 5 mounted upon the stationary longitudinal members 6 to which the cross stay x is secured. The pressure which the gummer 2 may exert upon the pile of blanks is capable of being adjusted by the counterbalancing weight 7. The blank-withdrawing device comprises a suction mouth arrangement exemplified, as will be clear from Figs. 3 and 4, by two pairs of nozzles 8 one pair being disposed longitudinally of the drum z before referred to and diametrically opposite the other pair. Each nozzle 8, as shown in Fig. 5, is fitted with a sleeve 9, retractable to a slight degree against the action of a spring 10 and carrying a rubber or other resilient mouth piece 11. The drum z is mounted to rotate upon a hollow shaft 12 closed at the ends and held, without possibility of rotating, by arms 13 upon the cross stay x the interior of the said shaft 12 being exhausted of air by any suitable means connected to the pipe 14. The shaft 12 is provided with ports one of which is shown at 15 so located that as a nozzle 8 reaches a position where the mouth piece 11 can engage a paper blank, it is in communication with the hollow shaft so that air is exhausted therefrom and the blank sucked up. Continued rotation of the drum z moves the suction nozzles clear of the said exhausting ports 15 so that the raised blank is released. The release of the blank is timed to occur at or near the instant when mechanical means act to grip the blank and remove it from the pile. Such means comprise a pair of endless bands 16 running over pulleys 17 upon a cross shaft 18 and over pulleys 19 upon a second cross shaft 20, the latter shaft being driven as by spur gears 21 from a shaft 22 connected by chain and sprocket gear 23 with a main driven shaft 24. The drum z is driven by chain and sprocket gear 25 from the shaft 22 which latter carries a roller 26 similar to rollers 27 on other shafts 28, 29 around which travel bands 30, 31 adapted to deliver a blank ultimately on to belts 32. The undersides of the bands 16 travel in the same direction as the upper sides of the bands 30 which they overhang and in order therefore that a blank after being gummed can be readily transferred from the pile to the bands 30, 31 it is only necessary to provide means for temporarily holding the blank in contact with the bands 16. This is shown as effected by rotary cheek members 33 shown separately in Figs. 7 and 8 and each mounted upon a spindle 34 working loosely within a hollow non-revoluble shaft 35 fitted with a cam 36 of the shape shown in Fig. 7. Each cheek member 33, which bears against the corresponding belt 16, is slotted at 37 to receive a sliding arm 38 each arm having a pin 39 projecting laterally through a slot 40 and connected to one end of a corresponding spring 41, anchored at 42 to the cheek member 33. The arrangement is such that as long as either pin 39 bears upon the edge of the cam which is concentric with the axis of the spindle 34, the spring 41 connected thereto will be elongated as shown at the upper part of Fig. 7 and the arm 38 withdrawn. As soon however as the cheek member 33 has rotated sufficiently far to cause the slot 40 to lie more or less parallel to the flattened edge 43 of the cam the pin 39 will be free to travel along the slot, the spring consequently quickly shooting the arm 38 out beyond the periphery of the member 33 as shown at the lower part of Fig. 7. When the pin 39 upon further rotation of the member 33 engages the edge 44 of the cam it will lag in the slot 40 until the opposite end of such slot is reached at which time it will have completely extended the spring 41 and moved to the concentric edge of the cam, which as previously explained, will maintain the arm 38 retracted. By appropriate angular adjustment of the cam 36 it will be obvious that the projection of the arms 38 can be made to occur at a position best suited to deal with the blanks. Here it will be convenient to explain with the aid of Fig. 9 the operation of removing the blanks. When the drum z occupies the position (a) the uppermost blank which at the other end is being held by the gumming device 2 will notwithstanding a very slight angular movement of the nozzles 8, have become appreciably buckled, somewhat as shown. This buckling rapidly increases and becomes more localized towards the nozzles 8 as positions (b) and (c) are reached. The release of the blank from the nozzles 8 takes place about position (c) at which time the arms 38 of the

cheek member 33 will be found projecting to direct the blank into contact with the bands 16 which as already stated will thereafter clamp the blank upon the cheeks and rapidly convey it to the bands 30, 31.

To facilitate dealing with blanks of different shapes the hollow shafts 35 wherein the spindles 34 of the check members 33 revolve, are mounted in bearings 45 adjustable along the frame members 6, the spindle 34 being driven from the shaft 22 by chain and sprocket gearing 46 comprising a twin idler 47 mounted upon the pivot 48 of a collapsible link holder 49 whereby the drive is maintainable without altering the length of chain or otherwise interfering with the gear.

The part of the table *a* upon which the pile *f* of blanks is directly received may be alterable in shape to approximately that of the blanks. Thus as shown in Fig. 10 it may comprise a number of bars 50 mounted to slide in relation to one another the ends being made to conform to any irregular outline.

As will be understood the apparatus may be variously modified. For example in lieu of the gummer being arranged above the pile of blanks and the latter elevated towards the gummer as described, the gummer may be associated with a stationary table beneath the pile of blanks which descends as a whole, the gum being applied to the underside of the lowermost blank which is displaced by the suction device in a manner analogous to that described.

What I claim is:—

1. The herein described method of applying an adhesive to a pile of paper blanks by means of a shaped gummer which consists in urging the said pile of blanks against the shaped gummer so that they are held thereby, providing for the lateral withdrawal from said gummer of a blank in contact therewith and subjecting said blank whilst held by the gummer to a buckling action in a direction opposite to that in which it is to be withdrawn in such wise that the blank is thereby directly brought into contact with the withdrawing means, the successively gummed blanks over-lapping and being separated only sufficiently to prevent one being fouled by the gum upon another, as set forth.

2. A machine of the kind described, comprising a relatively fixed but yieldingly mounted shaped gummer, means for urging a pile of blanks into contact with said gummer so that the outermost blank of the pile is held thereby, continuously operating gripping means contiguous to edges of the blanks to opposite sides of the gummer and adapted to withdraw a blank in one direction away from the gummer and means operating in the space between said gripping means for urging the blank that is being held by the gummer in a direction opposite to that in which the gripping means subsequently effect withdrawal and adapted to so buckle the said blank that it is brought directly thereby into contact with the gripping means, substantially as described.

Signed at London, England, this 15th day of September, 1920.

HERBERT CHARLES BROOKS.