No. 792,583. PATENTED JUNE 20, 1905.

J. M. CARNCROSS.

BOX MAKING MACHINE.

APPLICATION FILED AUG. 12, 1903.

2 SHEETS—SHEET 1.

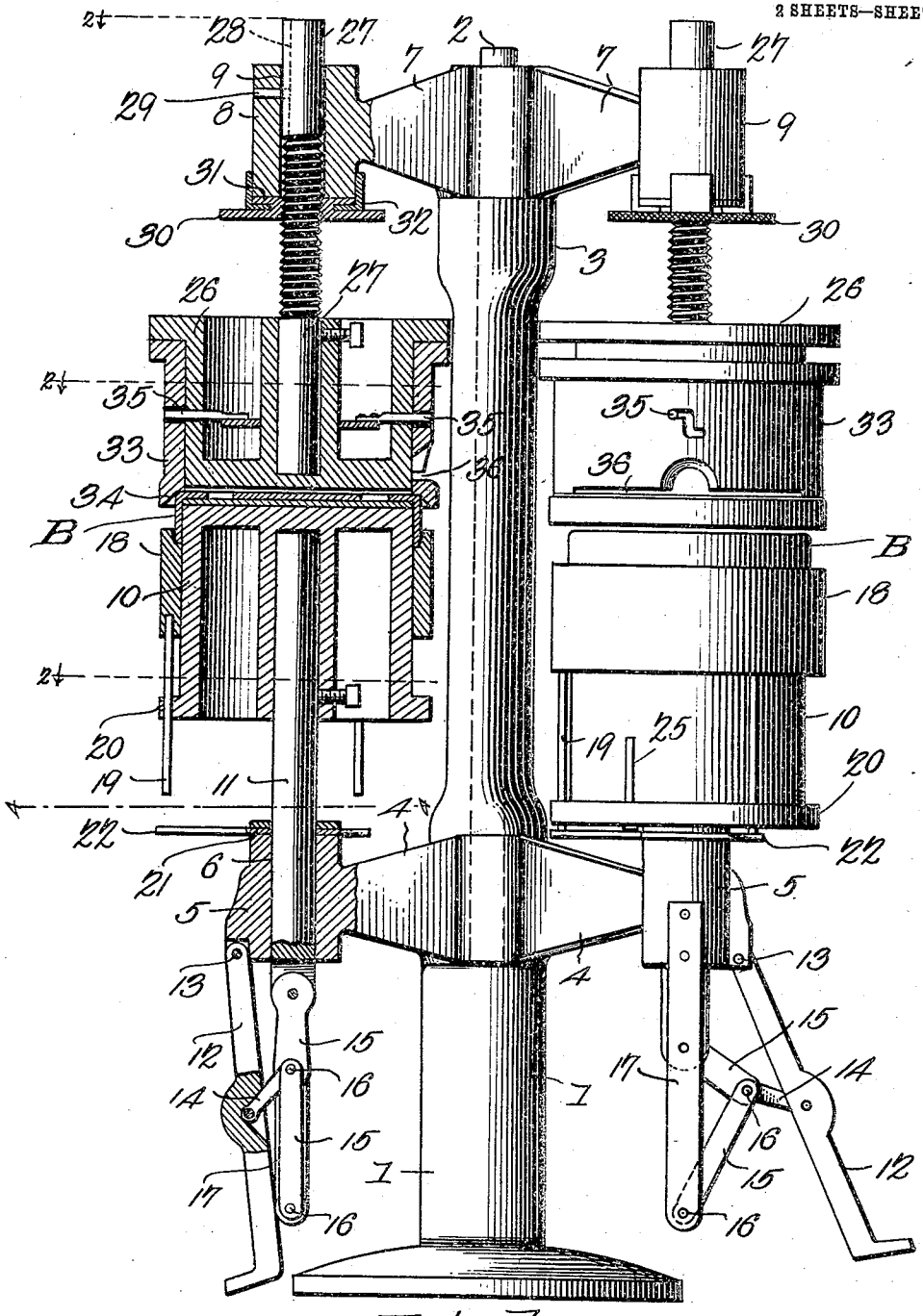


Fig. 1.

Witnesses
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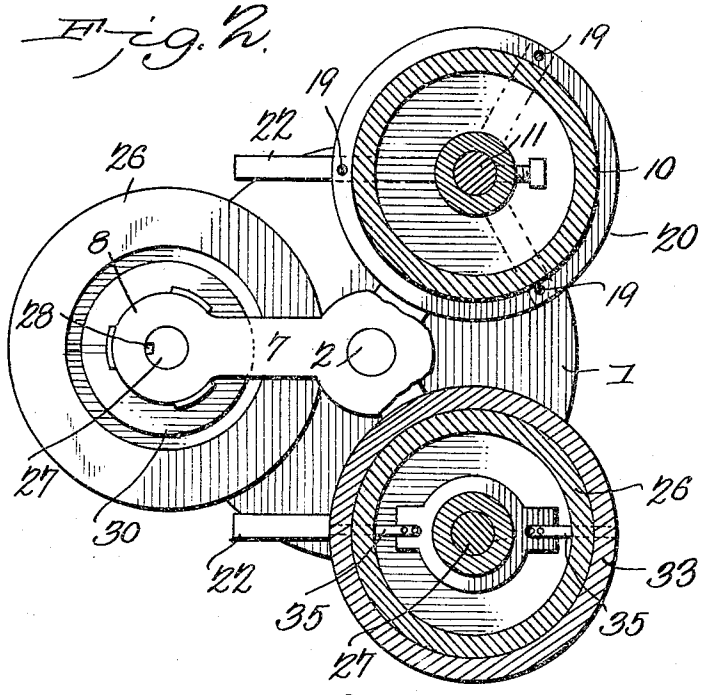
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2 SHEETS—SHEET 2.

Fig. 2.



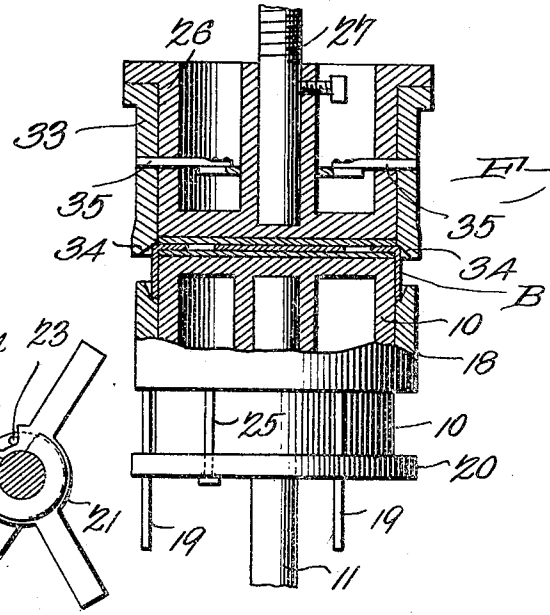


Fig. 3.

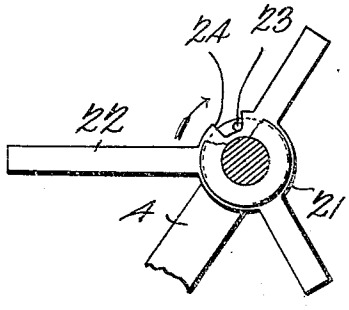


Fig. 4.

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No. 792,583. Patented June 20, 1905.

UNITED STATES PATENT OFFICE.

JACOB M. CARNCROSS, OF JACKSON, MICHIGAN.

BOX-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 792,583, dated June 20, 1905.

Application filed August 12, 1903. Serial No. 169,294.

To all whom it may concern:

Be it known that I, JACOB M. CARNCROSS, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented a new and useful Box-Making Machine, of which the following is a specification.

My invention relates to box-making machines, and especially to a machine for forming the heads or ends of paper boxes, and has for its objects to produce a device of this character of simple construction, which will be efficient in operation, one in which one box-head may be formed while another is drying, thus permitting a continuous operation of the machine, and one from which the box-heads after completion may be readily removed.

To these ends the invention comprises the novel details of construction and combination of parts more fully hereinafter described.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional elevation. Fig. 2 is a horizontal section plan on the line 2 2 of Fig. 1. Fig. 3 is a detail view. Fig. 4 is a similar view on the line 4 4 of Fig. 1.

Referring to the drawings, 1 indicates a supporting-base, from which arises a vertical cylindrical shaft or spindle 2 for sustaining a rotary frame 3. The rotary frame of the machine consists of a vertical tubular sleeve or hub journaled upon the shaft, provided at its lower end with three horizontal radiating arms 4, each terminating at its outer end in a head 5, having a central vertical opening 6, and at its upper end with three horizontal arms 7, terminating in heads 8, having central openings 9, these upper arms being in vertical alinement with the lower arms.

The rotary frame 3 carries three sets of box-forming mechanisms; but inasmuch as these mechanisms are all identical in construction and operation I will describe but one in detail. In each of said mechanisms 10 indicates a vertically-movable primary die fixed upon a shaft 11, mounted for vertical reciprocation in the opening 6 of head 5. For actuating the shaft, and consequently the die, I employ a lever 12, pivoted at its upper end, as at 13, in a bearing carried by the head 5 and acting through a substantially horizontal link 14 upon suitable toggle-links 15, the upper of which is pivoted to the lower end of the shaft and the lower to a horizontal journal or pintle 16, carried by a pair of spaced vertical arms or standards 17, attached at their upper ends to and depending from the head 5, the links 15 being connected at their central pivotal joint to the link 14. From this construction it will be seen that when the lever 12 is swung inward the links 15 in assuming a position in vertical alinement will, through shaft 11, force the die 10 upward, while a reverse movement of the die will follow upon the lever 12 being swung outward. At this point it is to be noted that I may, if found expedient to do so, dispense with this particular mechanism for operating the die and employ instead a hand-wheel and screw or compressed air and that such a change would not amount to a departure from my invention.

In practice the die 10 receives the body portion or blank of the box-head, which is maintained thereon by an annular band or member 18, arranged to loosely encircle the die and embrace the blank. The member 18 is provided with a plurality of arms or pins 19, which depend vertically from its lower edge through guide-openings formed in a flange 20 upon the lower end of the die, and fixed upon the upper face of the head 5 is a member 21, carrying radiating arms 22, designed to engage beneath the pins 19 to hold the ring in fixed position during downward movement of the die, whereby the box-head will be discharged therefrom when desired. The member 21 is capable of a slight rotation controlled by a pin 23, disposed in a slot or opening 24, in order that the arms 22 may, when circumstances require, be moved from beneath the pins, thus permitting the ring to normally move with the die, under which conditions the ring will fall by gravity to a point about central of the die and rest upon supporting pins or members 25.

In forming the box-head the primary die 10 coöperates with a secondary die 26, fixed upon the lower end of a vertical shaft 27, externally screw-threaded throughout a portion of its length. This shaft is vertically movable

in the opening 9 of head 8 and is slotted longitudinally, as at 28, for engagement with a horizontal pin 29, carried by the head, whereby rotation of the shaft is prevented. The shaft is reciprocated vertically by means of a hand-wheel 30, having a hub internally threaded for engagement with the threaded portion of the shaft, said hub being provided at its upper end with a flange 31, engaging flanged members 32, fixed to the head 8. By this arrangement the die 26 can be adjusted to the proper position relative to die 10 by rotating the hand-wheel 30, the die after being brought to the proper adjustment remaining fixed during the operation of the device.

Mounted upon and encircling the die 26 is an annular band or crimping member 33 of a length somewhat greater than the length of the die and extending slightly beneath the lower end of the latter. The extended end of the member is outwardly flared, preferably by beveling its inner face, as at 34, the purpose of which will presently appear. This member is adjustably secured upon the die by means of horizontal arms 35, which radiate from the hub of the latter and have their outer ends disposed each in a substantially Z-shaped aperture formed through the wall of the ring, whereby the latter may be adjusted vertically upon the die to an upper or lower position and fixed in either of said positions by a slight rotation, bringing the horizontal portions of said apertures into engagement with the arms. The ring is also provided through its side wall, just above its flaring mouth, with a horizontal slot 36, through which the disks of paper forming the end of the box-head may be introduced when the member is in the lower of its two positions.

In practice the blank for forming the body portion of the box-head is placed upon the die 10, upon the end of which there is also arranged a disk of pasteboard or the like constituting the inner member of the end. The die 26 is then brought to the proper adjustment in the manner above described with the ring 33 adjusted thereon to its upper position. Inward movement of the lever 12 now serves to move the die 10 upward, as heretofore explained, whereby the upper edge of the body-blank, which projects slightly above the die, will contact with the inner bevel 34 of the crimping member and be thereby turned inward over and upon the end of the die and the disk thereon. The die 10 is now moved downward in order that paste may be applied to the overturned edge of the body-blank, and the crimping member is adjusted to its lower position upon the upper die, and a disk or blank forming the outer end member of the head is inserted to position through the slot 36. Die 10 is then again moved upward, whereby the outer disk will be pressed upon the outer end of the box-head, the parts being allowed to remain in this position until the paste dries, after which member 21 is moved for bringing its arms 22 beneath the pins 19 and the die 10 is moved downward, whereby the completed box-head will be discharged, owing to the holding of the ring 18 against movement, as heretofore described.

While the paste or cement is drying upon one of the box-heads the frame 3 may be rotated for bringing another box-forming mechanism to position, and a second head may be formed thereby in a manner identical with that above described, and so on until the first-formed head has dried and been discharged in its completed state, thus rendering the operation of the machine continuous.

From the foregoing it will be seen that I produce a device of simple construction, which in practice will admirably perform its functions to the attainment of the ends in view; but it is to be understood that I do not limit myself to the precise details herein set forth, inasmuch as minor changes may be made therein without departing from the spirit of the invention.

Having thus described my invention, what I claim is—

1. In a box-machine, the combination with a frame, of a reciprocatory shaft sustained thereby, means for reciprocating the shaft, a primary die carried by the shaft, means for maintaining a blank upon the die, a secondary die, a crimping member associated therewith, a screw-threaded shaft movably sustained by the frame, and a hand-wheel for actuating the shaft to adjust the secondary die relative to the primary die.

2. In a box-machine, the combination with a frame, of a reciprocatory shaft sustained thereby, means for reciprocating the shaft, a primary die carried by the shaft, a blank-holding member embracing the die, means permitting said die to move independently of said member, a secondary die, means for sustaining the same, and a crimping member associated with the secondary die.

3. In a box-machine, the combination with a frame, of a reciprocatory shaft sustained thereby, means for reciprocating the shaft, a primary die carried by the shaft, a blank-holding member embracing the die and provided with depending pins, a member sustained by the frame and operable for engaging the pins to hold the blank-holding member during downward movement of the die, a secondary die, and means for sustaining the same.

4. In a box-machine, the combination with a primary reciprocatory die, of means for reciprocating the same, means for maintaining a blank upon the die, a secondary die, means for adjustably sustaining the same, an adjustable crimping member associated with the secondary die, and means for securing said member in its adjusted positions.

5. In a box-machine, the combination with

a primary reciprocatory die, of means for reciprocating the same, means for maintaining a blank upon the die, a secondary die, means for movably sustaining the same, and an adjustable crimping-ring surrounding the secondary die.

6. In a box-machine, the combination with a frame, of a reciprocatory shaft sustained thereby, a pair of toggle-links connected with the shaft, a lever operatively engaging the links for actuating the same to reciprocate the shaft, a primary die carried by the shaft, means for maintaining a blank upon the die, a secondary die, means for sustaining the same, and a crimping member carried by the secondary die.

7. In a box-machine, the combination with a base, of a shaft carried thereby, a frame mounted for rotation upon the shaft, and a plurality of independent box-forming mechanisms carried by the frame, said mechanisms comprising each a primary die, means for reciprocating the same, means for maintaining a blank upon the die, a secondary die, and a crimping-ring surrounding the secondary die.

8. In a box-machine, the combination with a frame, of a primary reciprocatory blank-receiving die sustained thereby, means for reciprocating said die, a secondary die, a crimping-ring surrounding the latter, and means for adjustably sustaining said ring.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JACOB M. CARNCROSS.

Witnesses:
R. D. KNOWLES,
L. R. KNOWLES.