

A. G. WOBUS & W. L. HUMPHREYS.
PAPER BOX FORMING MACHINE.
APPLICATION FILED SEPT. 6, 1910.

1,017,836.

Patented Feb. 20, 1912.

3 SHEETS—SHEET 1.

FIG. 1

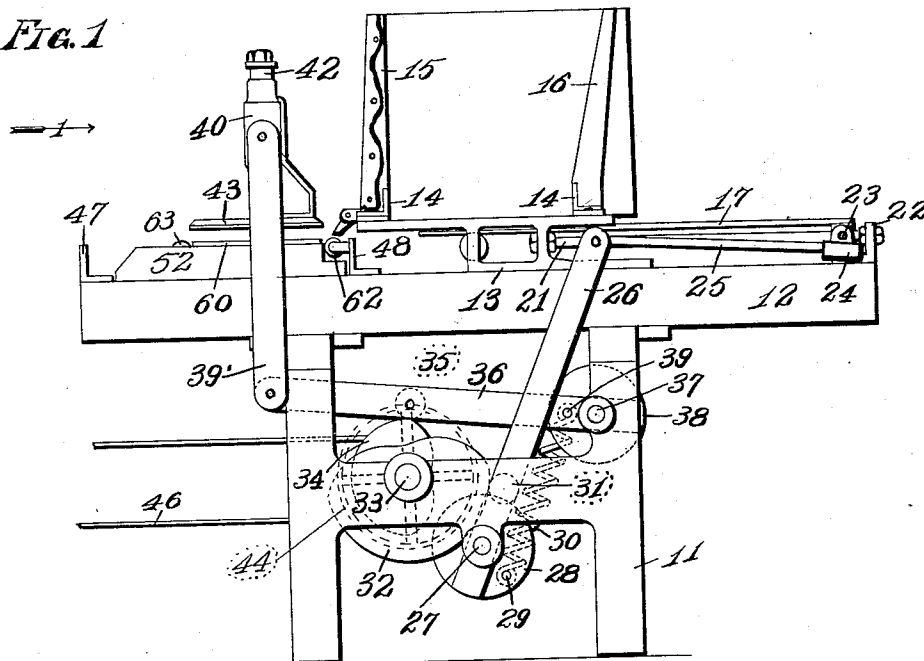
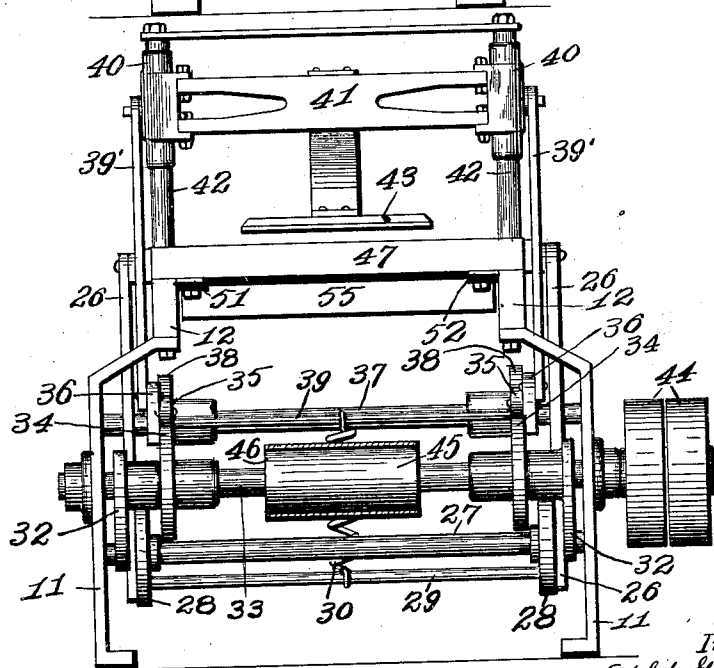


FIG. 2



Witnesses
H. C. Klein
M. E. Lindsay.

Inventors
Adolph S. Wobus
Walter L. Humphreys
by Alfred A. Wick's Atty.

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3 SHEETS—SHEET 2.

FIG. 3

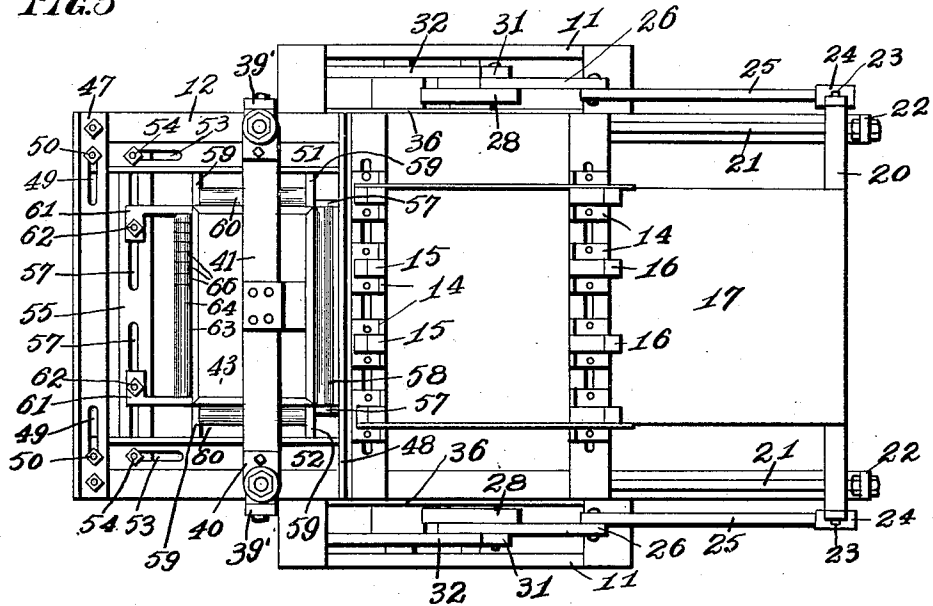
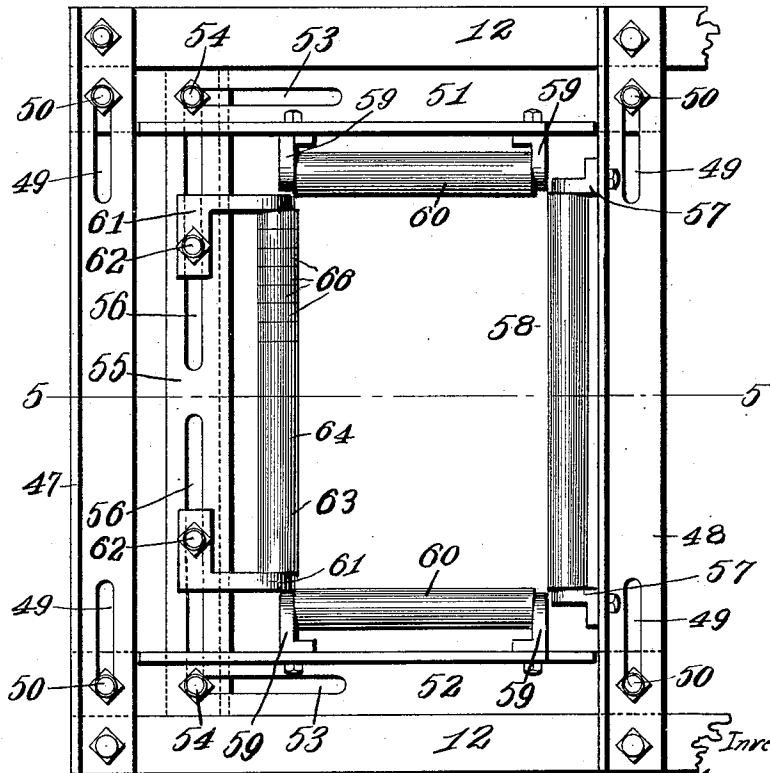


FIG. 4



Witnesses
H. C. Klein
M. G. Lindsay.

Inventors
Adolph E. Wobus
Walter L. Humphreys
by Alfred A. Beck's atty.

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3 SHEETS—SHEET 3.

FIG. 5

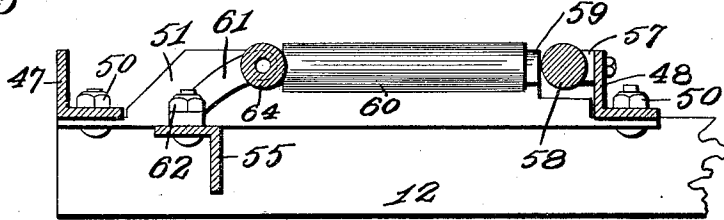


FIG. 6

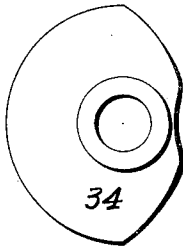


FIG. 7

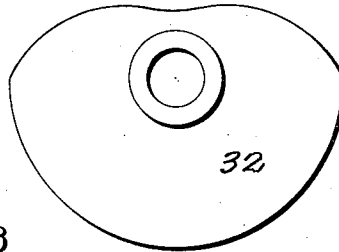


FIG. 8

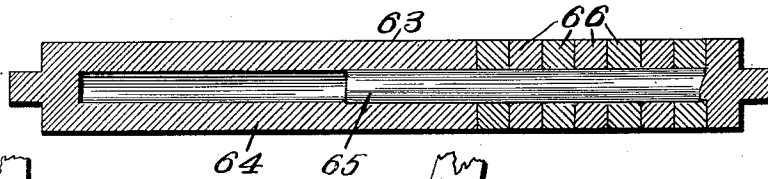


FIG. 9

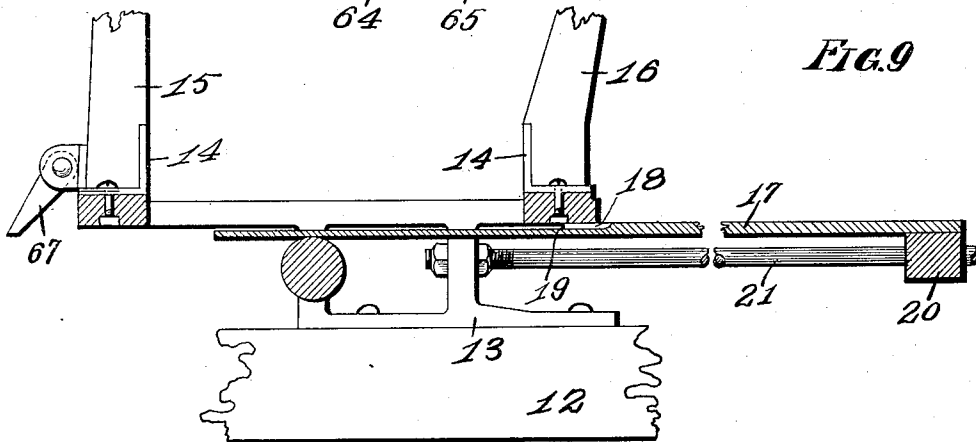
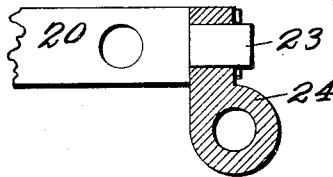


FIG. 10



Witnesses

H. C. Stein
M. E. Lindberg

Inventors

Adolph S. Wobus
Walter L. Humphreys
by Alfred A. Everts Atty.

UNITED STATES PATENT OFFICE.

ADOLPH G. WOBUS AND WALTER L. HUMPHREYS, OF ST. LOUIS, MISSOURI.

PAPER-BOX-FORMING MACHINE.

1,017,836.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed September 6, 1910. Serial No. 580,734.

To all whom it may concern:

Be it known that we, ADOLPH G. WOBUS and WALTER L. HUMPHREYS, citizens of the United States, and residents of St. Louis, Missouri, have invented certain new and useful Improvements in Paper-Box-Forming Machines, of which the following is a specification.

This invention relates to improvements in a paper box forming machine, and has for its object a hopper in which the blanks are stacked, an automatic feeding device for advancing each individual blank at a proper period over a die, and a plunger for pressing the blank through the die and simultaneously forming the ends and side walls of the box.

A feature of our invention is to construct a machine having a die constructed adjustably so as to accommodate various sizes of blanks for the construction of various sizes of boxes, and a device for feeding the blanks over the die.

Figure 1 is a side elevation of our complete invention. Fig. 2 is an end view of Fig. 1 viewing the same in the direction indicated by arrow 1. Fig. 3 is a top plan view of the same. Fig. 4 is an enlarged view of the adjustable die frame. Fig. 5 is an enlarged sectional view of the die frame taken on the line 5-5 of Fig. 4. Figs. 6 and 7 are detail views of cams made use of in operating our invention. Fig. 8 is an enlarged sectional view of one of the extension rollers made use of in connection with the die. Fig. 9 is an enlarged sectional view of the hopper and the feeder plate. Fig. 10 is a detail view of the pivotal connection carried by the feeder plate.

In carrying out our invention we provide a suitable supporting frame or standard 11 on the top of which is mounted a bed plate 12, and on said bed plate is securely bolted, or otherwise fastened a pair of brackets 13, on each side, and on the top of said brackets are located adjustable angle bars 14 to which are secured uprights 15 and 16, the upright 16 being tapered as shown in Fig. 1 to accommodate the easy insertion of the straw board blanks, which are first cut to the size required for the formation of the box. The under side of the hopper which is formed by the uprights is open and the blanks are supported therein by the feeder plate 17, the forward end of the feeder plate being recessed as indicated

by the numeral 18, making the forward end thinner than the rear portion thereof. This recess is of such depth as to correspond with the thickness of the straw board blank, and when the feeder plate is brought forwardly by the operating mechanism, which will be described hereafter in detail, the straw board blank located in the recess will be advanced forward from beneath the stack of blanks by the edge 19 of the feeder plate contacting with the edge of said blank, passing smoothly beneath the stack of blanks and advance the same in proper position over the die.

The feeder plate is supported on a sliding block 20, which operates on the guide rods 21, one end of said rods secured to the bracket 13, the other end to the angle bar 22 supported on the bed plate.

The ends of the block 20 are provided with trunnions 23, on which are pivotally mounted the pivotal connection 24 (see Fig. 10). In this connection is secured one end of the rods 25, the opposite ends of said rods pivotally connected to the upper end of the levers 26, and said levers are pivotally supported on a shaft 27 supported in the frame, or upright 11. These levers are so located as to project one on each side of the bed plate 12 (see Fig. 2). The levers 26 are provided with disks 28, and connecting the same is a rod 29 to which one end of a coil spring 30 is attached. The levers 26 are also provided with a roller shown by dotted lines in Fig. 1, and indicated by the numeral 31, these rollers are located on the outside of the levers and are so arranged as to contact with the cams 32 mounted on the driving shaft 33. These cams are so set as to operate the levers at a proper period bringing the longest point of contact of said cam in operation with the rollers 31, to place the feeder table in its normal rearward position, as shown in Fig. 1 ready to receive and advance another blank. On the shaft 33 is also mounted cams 34 which contact with rollers 35 located on the levers 36 pivotally connected to the frame by means of the shaft 37, said levers 36 also provided with disks 38 connected together by the rod 39 to which the other end of the spring 30 is attached. The disks 28 and 38 are firmly attached to the levers so as to prevent the same from operating independently. The opposite end of the levers 36 are connected to the vertical bars 39', which extend upwardly on the side

of the bed plate, the upper ends connected to the heads 40, which support the plunger bar 41. The heads 40 are slidably mounted upon the posts 42 secured to the bed plate, and upon said posts the heads 40 together with the plunger bar 41 are permitted to be raised and lowered. On the plunger bar 41 is suspended the plunger head, or male portion of the die 43.

10 The shaft 33 is provided with the driving pulleys 44, by which the mechanism is driven, and also on said shaft, and centrally located is an elongated pulley 45, over which an endless belt or conveyer 46 operates.

15 The adjustable die frame is constructed as follows: Firmly attached to the bed frame are angle bars 47 and 48 arranged parallel with each other (see Fig. 4), and are each provided with elongated slots 49 through which bolts 50 are passed. To the angle bars 47 and 48 are supported parallel angle bars 51 and 52, also provided with elongated slots 53, and beneath the angle bars 51 and 52, and supported by bolts 54 passed through the slots 53 is an angle bar 55 provided with elongated slots 56. On the bar 48 is firmly attached a pair of brackets 56 between which is rotatably mounted a roller 58. On the bars 51 and 52 are provided brackets 59 between which are rotatably mounted rollers 60. On the bar 55 is mounted a pair of brackets 61, which are provided with bolts 62, which pass through the slots 56 so that said brackets can be adjusted to accommodate the insertion of various lengths of rollers so as to conform to the required die opening. Between these brackets is inserted our adjustable roller 63, a detail of which is shown in Fig. 8, and it consists of a hollow portion 64 in which is inserted the spindle 65 forming part of the opposite end of said roller, and upon said spindle is placed any number of washers 66. By applying or removing these washers, the roller 63 can be shortened or lengthened, if desired, so as to conform to the size of the opening between the rollers 58, 60 and 63. The roller 58 is arranged to remain in its set position. In order to shorten the length of the box the rollers 60, together with their sliding angle bars 51 and 52 are moved upwardly by adjusting the same in the slots 56 of the bar 55. To shorten the length it is necessary to shorten the roller 63, to do this several of the washers are removed and the brackets 61 are adjusted accordingly, and to shorten the width, if desired, the bar 55 is adjusted in the slots 53 formed in the bars 51 and 52. By this means of adjustment various sizes of boxes can be constructed without the necessity of providing a separate and distinct die for each size. When the die is adjusted to a given size it is necessary for the operator to provide a plunger head 43 of the required size, this is done by removing and

replacing the head with one of a size sufficient to correspond with the die opening.

The plunger and the feeder table are operated alternately by the spring 30 in conjunction with the release of the cams, and after one of the blanks has been advanced and placed in position over the die, the blank is held in this position and prevented from returning with the feeder table on its backward movement by the dog 67 connected to the forward end of the hopper. This dog is so arranged as to permit the same to pass freely over the blank as the same is being advanced, and when passed, permitted to contact with the edge thereof and retain the same in position over the die.

The operation of our invention is as follows: In the first instance the several rollers forming the die are adjusted in accordance with the size of box to be formed. The blanks which have been previously cut in accordance are placed in the hopper, the driving shaft is then placed in operation and after the cams 32 are operated and the highest point of contact of said cams passing over the rollers 31, at the same time the rollers 35 riding on the highest point of contact of the cams 34, retaining the plunger in its position, the contraction of the coil spring pulls upon the levers 26 advancing the feeder plate forward carrying with it the lowest blank of straw board, placing it in position over the die. At this period the cams 34 have advanced at a point where the rollers 35 have passed the highest point of contact, on the other hand the highest point of contact of the cams 32 is in communication with the rollers 31 and commences to operate the feeder table rearwardly to its position to receive a second blank. By the operation the tension of the spring operates against the levers 36 pulling downwardly upon the die, causing the same to pass between the several rollers carrying with it the blank, and by this operation forming the sides and ends of the box, and what is termed commercially as folding. The folded blank after passing through the die is permitted to fall upon the endless belt or conveyer and is carried to a convenient location, where the same are removed.

Having thus fully described our invention, what we claim as new and desire to have secured to us by the grant of Letters Patent, is:

1. A paper box forming machine comprising a frame, a bed plate, an adjustable die mounted thereon and formed of rollers, one of said rollers being formed in sections, a plunger, a feeder plate for advancing blanks over the die and a cam operating mechanism for operating the feeder plate and plunger alternately, substantially as specified.

2. A device of the class described com-

prising a frame, a bed plate, a die comprising rollers one of said rollers being sectional adjustably mounted, a sliding feeder plate, a hopper, a plunger located above the die, a lever mechanism for operating the plunger and the feeder plate alternately, and cams for controlling the movement of said levers, substantially as specified.

3. A device of the class described comprising a frame, a bed plate, a hopper mounted on said frame in which the blanks are placed, a sliding feeder plate operating beneath the hopper, a die located in advance of the hopper, a plurality of adjustable rollers one of said rollers being formed of sections forming the die frame, a plunger corresponding with the opening of the die arranged to operate therein, levers operating the plunger and the feeder plate, cams communicating with the levers for placing the same in operation alternately and a spring for controlling the movement of said levers when released by the cams, substantially as specified.

4. A paper box folding machine comprising a frame, a bed plate mounted thereon, a hopper supported above the bed plate, a feeder plate located beneath the hopper and supported on the bed frame, a die located in advance of the hopper, said die composed of a plurality of adjustable rollers forming the ends and one side of the die a sectional roller forming the other side of the die, an adjustable frame supporting the rollers, a plunger of a size to correspond with the opening of the die, levers connected to the plunger and levers connected to the feeder plate for operating the same, and cams supported in the frame for operating the levers alternately, substantially as specified.

In testimony whereof, we have signed our names to this specification, in presence of two subscribing witnesses.

ADOLPH G. WOBUS.

WALTER L. HUMPHREYS.

Witnesses:

ALFRED A. EICKS,

WALTER C. STEIN.