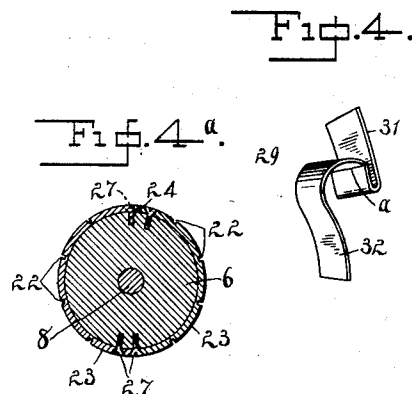
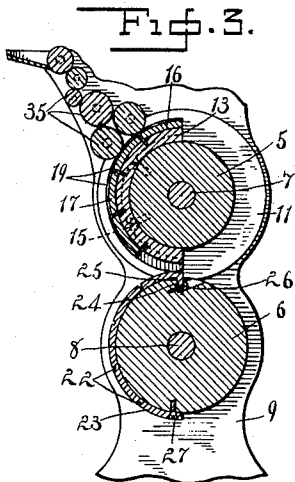
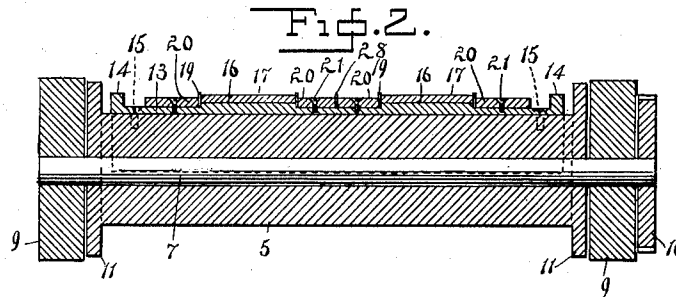
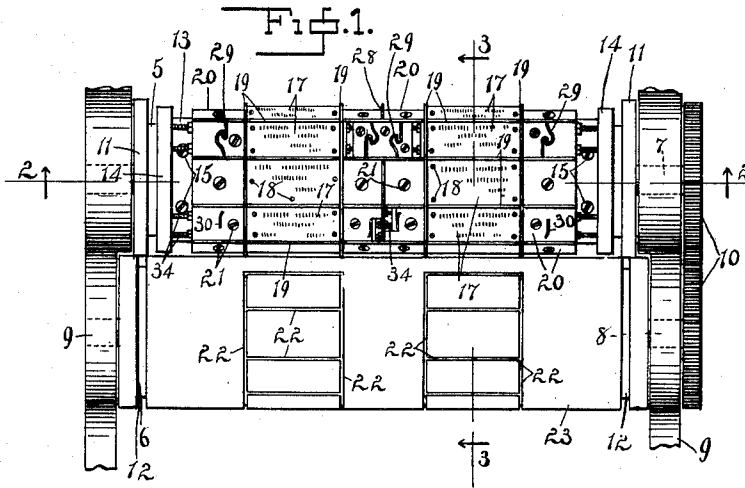


F. P. VAVRA.
MACHINE FOR MAKING PAPER BOX BLANKS.
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972,300.

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MACHINE FOR MAKING PAPER-BOX BLANKS.

972,300.

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To all whom it may concern:

Be it known that I, FRANK P. VAVRA, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making Paper-Box Blanks, of which the following is a specification.

My invention relates to apparatus for making paper boxes and refers especially to machines designed for completing the blanks used in constructing boxes of the folding type.

In the making of blanks for paper boxes two methods are followed for feeding the stock to the machine. In one of these methods a continuous roll of paper or other material is employed, and in the second method the material is furnished to the machine cut into sheets of the required size and these are fed singly to the operating mechanism either by hand or automatically. I prefer the method of feeding the paper in sheets by automatic means, although my improvements are equally applicable to the feeding from a continuous roll. In the appliances in vogue the forming of the blank is a procedure entirely distinct from the printing operation, each requiring a special apparatus. In my improved devices, however, I combine the two operations in one, the cutting, scoring and printing being done simultaneously and by the same set of rollers or dies, thus forming a complete box, or a plurality of boxes at one operation.

The chief objects of the improvements which form the subject matter of this application are to provide a mechanism for printing, scoring and cutting the material for paper boxes at a single operation, to furnish means for holding the necessary dies and plates so that they may be removed bodily from the operating rollers thus permitting others of a different size or pattern to be quickly substituted therefor, and to supply convenient methods of securing the parts of the dies to said holding means.

Other objects of the invention are to provide fastening devices for the dies of such design that duplicate sets may be assembled on opposite sides of the main roller so that the method of feeding from a continuous roll may be employed for the purpose of increasing the output, and to furnish removable platens for the coating roller.

I accomplish the above and other impor-

tant objects by the employment of the apparatus illustrated in the accompanying drawing forming a part of this application, and in which:—

Figure 1 is a front elevation of a pair of operating rollers equipped with my improved devices for producing finished plates suited to the manufacture of folding paper boxes. Fig. 2 is a sectional view on the line 2—2 of Fig. 1; Fig. 3 is a section taken transversely to the operating rollers and approximately on the line 3—3 of Fig. 1 a series of inking rollers being added to show their relation to the operating rollers. Fig. 4 is a perspective view of a special form of knife and Fig. 4^a is a cross section of a roller with two semicircular shells applied to its face.

Referring to the details of the drawing the numerals 5, 6, indicate a pair of cooperating rollers mounted upon shafts 7, 8, journaled in a frame 9, and furnished with intermeshing gears 10, having the same diameter to insure that the rollers will positively register in their rotary movements. The upper rollers 5 is reduced in diameter except at the ends, which are left full size to form collars 11, arranged to bear against the surface of the companion roller 6. The roller 5 carries the dies and impression plates which form and print the plates and is termed the main roller, while the lower and coating roller 6 is auxiliary thereto and performs the office of a platen. The dies and knives are not mounted directly upon the main roller as has heretofore been the practice but are carried upon a removable curved plate or shell 13, semi-cylindrical in form, and provided at the ends with flanges 14. The shell 13 is secured to the face of the roller 5 by screws 15, and, as shown in Fig. 3, covers but one half the roller. This is the arrangement when the paper is fed in sheets, a duplicate shell being applied to fill the remaining half of the roller when a continuous sheet is used, such an application not being shown, since it will be readily understood by any one skilled in the art.

The floor or outer face of the shell 13 is raised above the general surface in some portions as shown at 16, and upon these elevated parts the impression plates or electrotypes 17 are mounted, and secured thereto by screws 18.

Between the plates 17 and wherever required in the design are placed the scoring

blades 19, held in position by blocks 20 and secured by screws 21. The scoring blades project slightly above the printing surface of the impression plates 17, and are received in corresponding grooves or recesses 22 formed in the opposing surface of the auxiliary roller or platen 6. To facilitate the changing of the design, however, and for other reasons, such as economy in construction and saving in time, I prefer to provide the said roller 6 with a removable plate or platen 23 extending over half the circumference, as in the case of the shell 13 applied to the roller 5. I prefer to secure the shell 23 in a somewhat different manner from that used for the shell 13 one margin having a radial flange 24 which projects toward the center and is received in a longitudinal groove 25 where it is removably fastened by screws 26, other screws 27 being inserted near the opposite margin. Another curved platen may be applied to the vacant side of the roller 6 when the roller 5 is completely covered, so as to correspond therewith, the roller 6 being secured by screws in the manner shown in Fig. 4^a. Along the lines where it is desired to sever the sheets, cutters or knives are inserted and secured in place by any of the ordinary methods. These knives are either straight as shown at 28 or curved as indicated at 29, 30, to form the tongues and slits and are adjusted so that they touch the face of the platen without pressure thereon.

The curved knives 29 which are designed to cut tongues of special form are preferably made in two sections to facilitate shaping. These sections are shown at 31 and 32 in Fig. 4, the line of junction being indicated at *a*. As an aid in alining and registering the various dies and plates and to further secure the curved knives which are frictionally held, clamping bolts 34 are provided which have threaded engagement with holes in the flanges 14 of the shell or the blocks 20.

The general features of the application of the dies to the curved surfaces are similar to those made use of in rotary blank cutters and printing presses and further details will be unnecessary in this particular. The method of applying the ink by means of the rollers 35 shown in Fig. 3 and the paper feeding means are also well known in the art, and will be readily understood. The arrangement of the devices illustrated in Fig. 1 shows the mechanism adapted to print and cut two complete blanks from a single sheet, the parts lying upon either side of the median line being duplicates. This arrangement may be varied at will according to the

dimensions and design of the box to be produced, and a duplicate shell may be applied to the roller, as hereinbefore mentioned, so that even a greater number of box plates may be formed during one revolution of the rollers.

In operating the machine the sheets are fed in the ordinary manner between the rollers 5, 6, which are set in operation by means of power applied in any desired manner such application not being shown in the drawing. As the sheet passes between the rollers the action of the blades and knives will differ in no wise from that met with in ordinary machines, and the application of the ink by the rollers 35, and the impression of the printing plates are the same as observed in the common rotary printing press.

Having thus described my invention what I claim, is:—

1. In a machine for making paper-box blanks, two cooperating rollers and means for driving same, a sectional shell attached to one of said rollers, a plurality of printing plates spaced apart and removably attached to said shell, scoring knives and cutting knives arranged adjacent to said plates, means for removably holding said knives in operative position on said shell, means for clamping said sectional shell on said roller and a sectional shell removably attached to the other roller and having grooves to receive the edges of said knives.

2. In a machine for making paper boxes, the combination with a pair of cooperating rollers, end flanges on one of the rollers, and means for operating the rollers, of a semi-cylindrical flanged shell applied to the face of the flanged roller, devices consisting of scoring blades, knives and printing plates mounted on said shell, and means for attaching said devices, said means comprising clamping bolts engaging the shell flanges.

3. In a machine for the purpose stated, the combination with a pair of cooperating rollers, and gearing connecting the rollers, of a shell engaging the face of one of said rollers, and provided with a raised margin, and a curved plate engaging the other roller, and a radial flange projecting from said plate and engaging a longitudinal groove in the roller face.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK P. VAVRA.

Witnesses:

F. BENJAMIN,
M. A. MILORD.