

No. 618,286.

Patented Jan. 24, 1899.

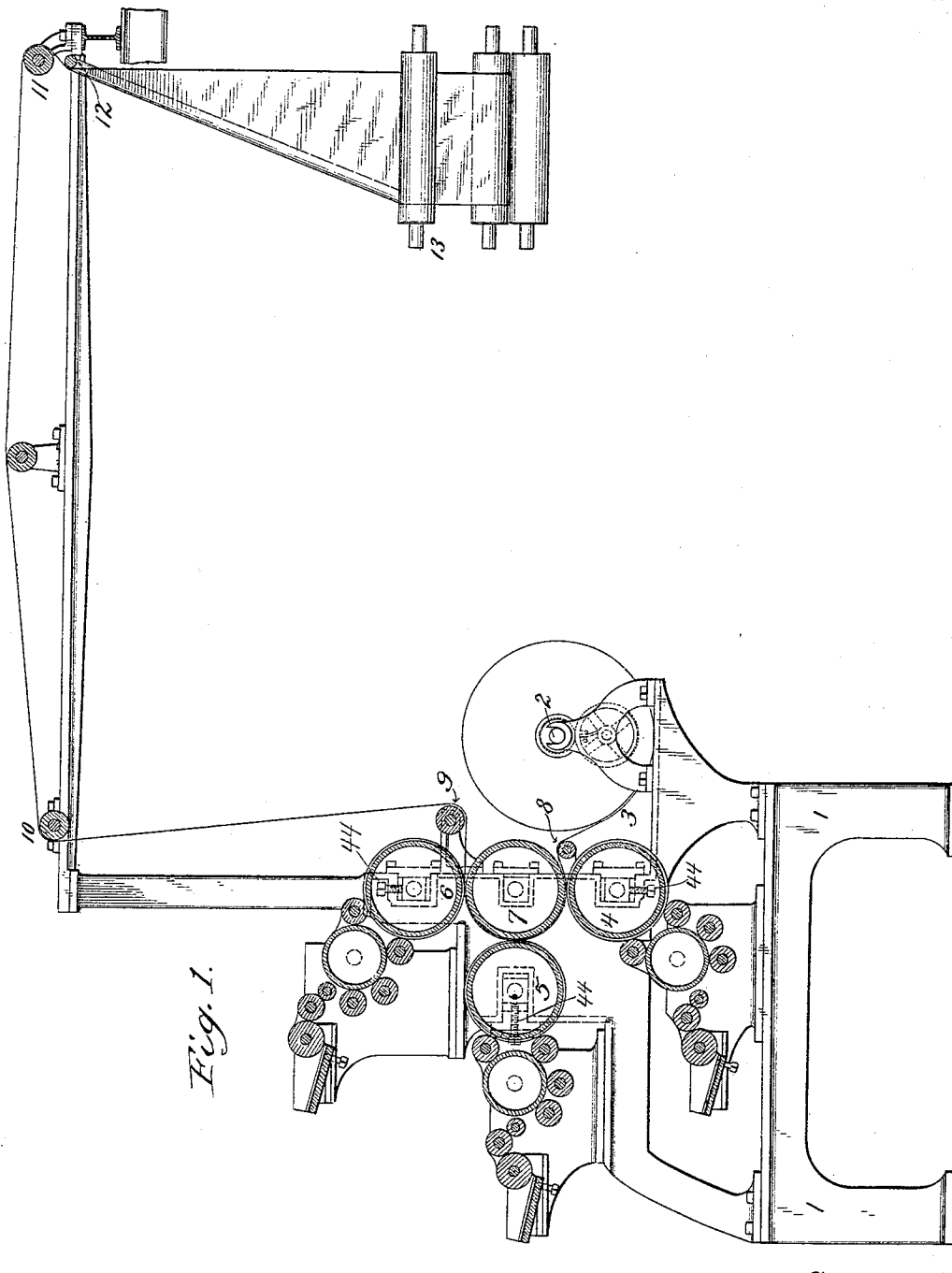
W. P. ORMSBY.

PRINTING APPARATUS FOR BAG MACHINES.

(Application filed Apr. 12, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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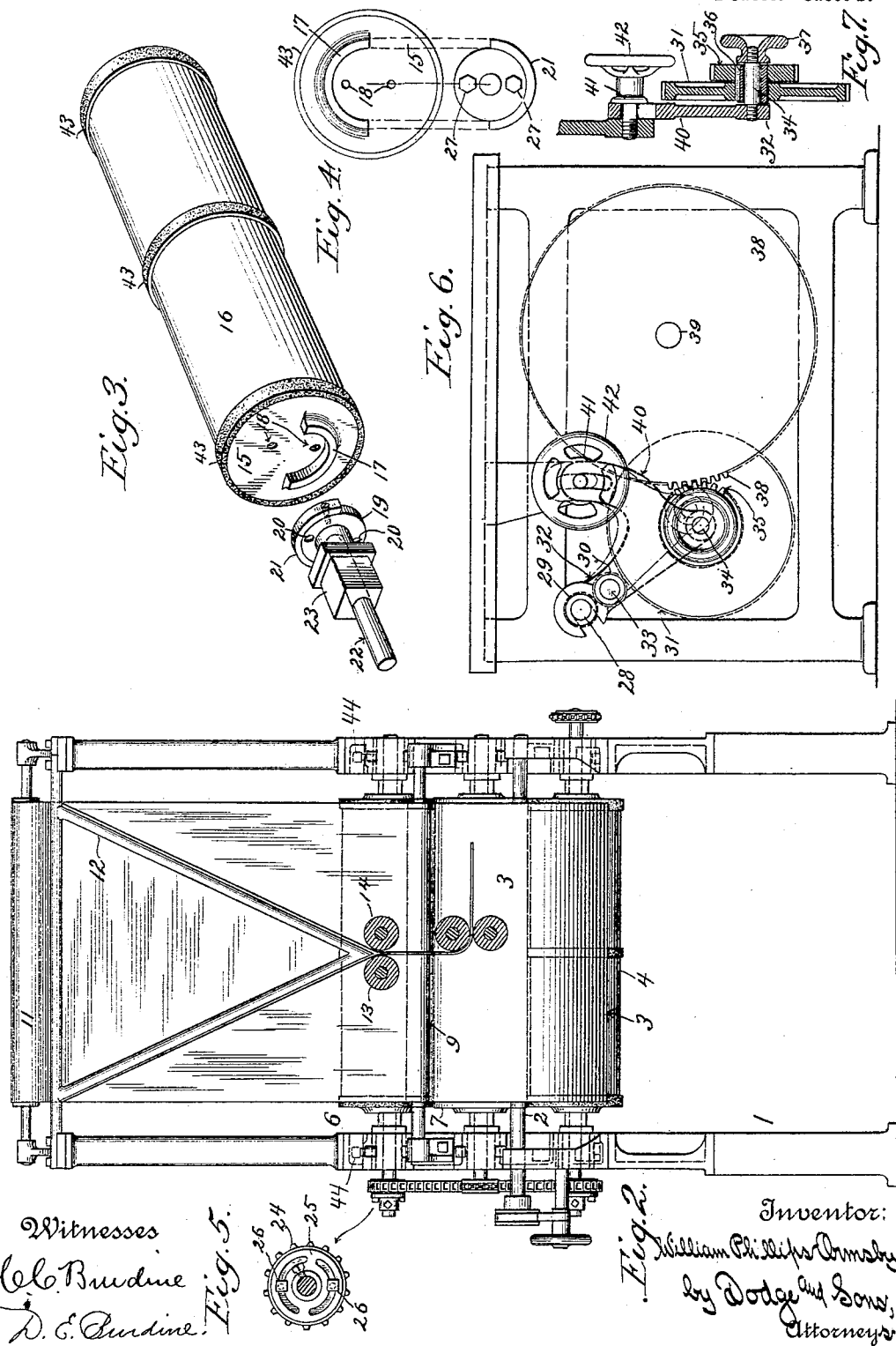
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UNITED STATES PATENT OFFICE.

WILLIAM PHILLIPS ORMSBY, OF NASHVILLE, TENNESSEE, ASSIGNOR TO THE
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PRINTING APPARATUS FOR BAG-MACHINES.

SPECIFICATION forming part of Letters Patent No. 618,286, dated January 24, 1899.

Application filed April 12, 1897. Serial No. 631,799. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PHILLIPS ORMSBY, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Printing Apparatus for Bag-Machines, of which the following is a specification.

My invention pertains to printing apparatus of bag-making machinery of the character set forth in Letters Patent of the United States, granted to William H. Kerr, assignor, dated January 27, 1891, and numbered 445,351.

The invention consists in novel features, details, and combinations hereinafter set forth.

In the accompanying drawings, Figure 1 is a sectional elevation of the printing and folding apparatus, showing also the first pair of feed-rolls of the bag-machine; Fig. 2, an end elevation of the same, showing the said rolls in section; Fig. 3, a perspective view of one of the form-rolls of the printing machinery, together with one of its short axles and the box therefor; Fig. 4, an end view of said parts, showing the manner of applying and removing a form-cylinder; Fig. 5, a view showing the provision for adjusting the cylinders; Figs. 6 and 7, side and sectional views of the variable-speed gear.

Under the construction set forth in the patent above mentioned the roll of bag material and the printing rolls or cylinders were arranged with their axes vertical. Such arrangement involves considerable difficulty in the matter of inking the forms, particularly as to evenness of distribution; and this difficulty is increased whenever the apparatus is brought to rest for any purpose. The present invention overcomes this difficulty by placing the fabric-roll and the printing-cylinders, inking-rolls, &c., in horizontal positions and interposing between the printing apparatus and the bag-making mechanism a folding device which effects a longitudinal folding of the printed goods through the middle and delivers them thus folded to the horizontal feed-rolls of the bag-making mechanism.

The present invention further affords a simple and expeditious means of changing the printing-cylinders to suit bags of varying size.

In describing the present invention those parts not necessary to a clear understanding of the features claimed will be omitted, it being understood that they may be of any known or approved construction.

Referring first to Fig. 1, the printing mechanism will be seen to consist, essentially, of a framework 1, in which is mounted a shaft or spindle 2, carrying a roll 3 of goods suitable for the making of bags of the desired class, a series of form-cylinders 4, 5, and 6, each with ink-fountains and inking-rolls, and an impression-cylinder 7 common to the several form-rolls. The ink-fountains, inking and distributing rolls, &c., may be of well-known pattern; but the form-cylinders are of peculiar construction, as explained farther on. The journals or axles are each carried in boxes capable of adjustment by means of screws 44, Figs. 1 and 2, to bring the cylinders into proper working relation to the impression-cylinder 7, the journals of which are carried in fixed boxes or bearings.

The goods to be printed are drawn in a single flat web or sheet from roll 3 and passed about impression-cylinder 7, traveling successively between said cylinder and the several form-cylinders 4, 5, and 6. Guide-rolls 8 and 9 direct the web or sheet to and from the impression-cylinder. Roll 9 may be omitted, if it be found at any time advisable so to do, to avoid possible blurring of the fresh impression, or it may be cut away at those portions where the printed surface would otherwise make contact with it. From the printing mechanism the web or sheet passes upward to and over a horizontal roll 10 and thence to a similar roll 11 above the folding guide or frame 12. Between the rolls 10 and 11 there may be one or more sustaining-rolls, if the distance be such as to render this expedient, and in practice such will usually be the case, as it is desirable to carry the material far enough to permit the drying or partial drying of the ink before the printed face is permitted to come into contact with any other surface.

The folding guide or frame 12 is simply a V-shaped frame with its wider end uppermost and its apex thrown out of vertical plane, with its upper end a distance equal to one-

half the width of the sheet or web, as will be readily understood upon reference to Figs. 1 and 2.

13 and 14 indicate pressing-rolls located in the same horizontal plane beneath the lower end of the folding guide or frame in position to receive the material and press it as soon as the two thicknesses or portions are brought together.

Below the pressing-rolls is a second pair of rolls arranged horizontally, one above the other, these representing or corresponding to the feeding-rolls E^1 E^4 of the patent noted and serving to carry the goods properly to the other mechanism of the bag-machine. By this simple means the necessity of using vertical printing-rolls is overcome, and the goods are taken from a horizontal roll, printed upon horizontal cylinders, and delivered horizontally into the bag-forming machine.

Referring next to Figs. 3 and 4, the construction of the form-cylinders will be explained. Each cylinder comprises two circular heads or disks 15 and a cylindrical shell or body 16, which latter may conveniently be formed of brass tubing of appropriate size and thickness. Each head is formed or furnished with a semi-circular projection 17 and is provided with two or more holes 18, threaded to receive tap-bolts. 19 indicates a disk of a diameter to fit accurately within the curved rib or projection 17 of the head 15 and having holes 20 to register accurately with the holes 18 of the head. 21 indicates a strap or band of metal or other suitable material secured to the periphery and extending half-way around the same. Its purpose is to form a pair of stops or shoulders, with which the ends of the semicircular rib or projection 17 of the cylinder-head may make contact when the cylinder is dropped into its place, thus bringing the parts to the precise relation required, with the axes of the cylinder and of journal or axle 22 in perfect alignment and the bolt-holes of the disk and cylinder-head in register. The shoulders formed by the ends of the strap or band 21 also serve to form a connection between the parts to cause them to turn as one, thus relieving the tap-bolts of lateral strain. It is obvious that instead of employing a separate strap the disk may be formed with an integral enlargement or projection or that studs, lugs, or pins may be formed upon or applied to the disk at the proper points. So, too, the form of the disk may vary, the rib or projection 17 being made to correspond in form and dimensions with the outline of the disk. The form and construction illustrated are, however, preferred, for the reason that the spindle, shaft, or journal 22, disk 19, and rib or projection 17 may all be finished and dressed to gage in a lathe, thus insuring accuracy of fit and adjustment with great facility of manufacture. The cylinders being thus constructed, it will be seen that if the two short shafts or spindles 22, with which each cylinder is to

be furnished, be properly placed in their bearing blocks or boxes 23, the latter being duly mounted in the frame of the printing apparatus, the cylinder may be dropped readily to place in the manner indicated in Fig. 4, and it is then only necessary to apply the tap-bolts to fasten the parts together ready for use.

In practice it is desirable ordinarily so to print the bag material that when the blanks are severed from the web and made up both faces of the bag shall be printed. The "form" or matter may be the same or different. To accomplish this, each cylinder is designed to carry two forms, which will be arranged with due regard to the manner of forming the bag—that is to say, with reference to the location of the fold at the end or at the side of the bag—both plans being feasible in practice. The forms are made of rubber or composition and are wrapped about and secured to the cylinder in a manner now common and well understood. Hence detailed description of this point is unnecessary. It will be seen, however, that the forms may be held in place by pins, hooks, clamps, or cement. At or near each end of the cylinder there is placed about it a ring or band 43, of rubber or other suitable material, as leather, paper or the like, which is made of a thickness equal to the thickness or height of the form, and midway between the ends of the cylinder a third ring or band of like character is located. The width of these bands may vary, though in practice the end bands may advantageously be from three-quarters of an inch to an inch and a half in width and the middlering may be from one-half to three-quarters of an inch wide, more or less. When made of rubber, these bands should be of about the consistency or firmness of wringer-rolls. Their purpose is to effect a constant and uniform feed of the webbing between the form-cylinders and the impression-cylinder regardless of the presence or absence of the form or of blank or low spaces therein. By drawing equally at the ends and at the middle they will insure a smooth and even surface upon which to print.

The form-cylinders and impression-cylinder are geared to rotate at equal surface speed, for which purpose chain belting may be carried about sprocket-wheels on the cylinder-shafts, or any other suitable system of gearing may be employed.

In placing the forms upon the respective cylinders or in introducing new cylinders it is difficult, if not impracticable, to set them so accurately as to insure proper location of their several impressions upon the web or sheet. To permit adjustment of the forms to meet this difficulty, the chain-wheel or gear-wheel of each form-cylinder is or may be made adjustable about its shaft, as indicated in Fig. 5, where the wheel 24 is represented as clamped to a circularly-slotted disk 25 by bolts 26. The disk 25 being made fast to the

shaft and the wheel 24 being loose thereon when the bolts are not tightened, it is only necessary to hold the chain-wheel and turn the shaft or hold the shaft and turn the chain-wheel until the parts are brought into proper relation. It will be seen that this provision may be made for only two of the three gears or chain-wheels and the third one made fast on its shaft, the two so provided being adjusted to proper relation to the third one.

I have above spoken of three form-cylinders; but it is to be understood that I may use any desired number, one or more.

Whenever it becomes desirable to change the printing-cylinders, whether for the purpose of making a change in size or merely in the form or forms, it is only necessary to withdraw the tap-bolts 27, lift out the cylinders, drop others into their places, and return the bolts. When a change of size is made, the impression-cylinder should also be changed in order to maintain the same relative surface speeds. Hence the impression-cylinder will be applied to its axles or journals in the same manner as the form-cylinders.

It will of course be understood that the bag-making mechanism—that is to say, the feeding devices, cutter, stitching mechanisms, &c.—must act once for each blank cut off or each bag produced, whether large or small, and it is therefore necessary to provide some simple and convenient change-gear to connect the printing mechanism with the bag-making mechanism proper.

In Fig. 6 I have shown a device suitable to the purpose to adapt it to changes in the size of printing-cylinders, 28 indicating the driving-shaft, provided with a pinion 29, which through an idler 30 gives motion to a gear-wheel 31. Pinion 30 and gear-wheel 31 are both supported by and rotate about studs carried by a bracket or hanger 32, one end or arm of which is hung upon or is concentric with the driving-shaft, as indicated. The stud 33, which carries pinion 30, may be a tap-bolt; but stud 34 is made long enough to accommodate not only the gear-wheel 31, but also a smaller gear or pinion 35, both of which are placed upon a splined or feathered sleeve 36, encircling the stud 34, the wheels and sleeve being all retained upon the stud by a nut 37, made in the form of a hand-wheel. The gear-wheel 31 being put in motion by idler 30 of course causes sleeve 36 to rotate with it, and this in turn gives motion to pinion 35, which meshes with and rotates a gear-wheel 38 on the cam-shaft 39 of the bag-machine, the spline of the sleeve fitting seats in both wheels 31 and 35. If now it be desired to vary the speed of the cam-shaft, which determines the movements of the cutter, pusher, &c., of the bag-machine and from which motion is transmitted to the printing mechanism, the nut or hand-wheel 37 is removed, pinion 35 is displaced and an-

other of proper size is substituted and put in mesh with wheel 38, and the machine is ready to work with the substituted printing-cylinders.

To provide for the adjustment of the bracket or hanger 32 to compensate for changes in the diameter of gear 35 and to hold it where adjusted, the bracket is provided with an arm 40, slotted concentrically with the driving-shaft 28, to receive the stem of a clamping-bolt 41, the threaded end of which screws into a fixed part of the framework of the machine, and the other end of which carries a hand-wheel 42. The slotted arm of the bracket is clamped between the frame of the machine and the hub of the hand-wheel, but may be made free for adjustment by simply turning back the hand-wheel when necessary.

The details of the bracket or hanger and the manner of supporting it upon the shaft are unimportant and may be varied as desired, as may also the clamping device. The construction shown is quite simple and will be found effective in use, but is already patented and not claimed herein.

The shell or body of the cylinder and the heads may be made integral or in one piece, if desired, without in any manner departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is—

1. In a printing-press, a main frame; short axles or shafts journaled therein; a printing-cylinder having its heads provided with ribs or projections to fit the inner ends of the short axles or shafts and guide the cylinder into axial alinement therewith; and fastenings for rigidly securing the cylinder to said shafts or axles.

2. In a printing apparatus, the combination of a frame; two independent sets of shaft or axle bearings carried by said frame, those of one pair laterally adjustable toward and from those of the other pair to adapt them to support rolls of varying diameters in proper working relation to a roll carried by the other pair; a cylinder journaled in one pair of said bearings; a pair of short axles or shafts journaled in the second set of bearings; and a printing-cylinder detachably secured to said short axles or shafts, substantially as and for the purpose set forth.

3. A cylinder for printing machinery, comprising a cylindrical body and heads provided with centering ribs or projections; short shafts or axles; and fastenings connecting the cylinder-heads and axles, the short axles being wholly external to the body and heads of the cylinder, substantially as shown and described, whereby the cylinder is adapted to be removed from the axles without varying the position of the latter.

4. In combination with cylinder body or shell 16, having heads 15 each provided with a rib or projection 17; axles or short shafts 22 provided with projecting shoulders to abut

against the ends of the projection 17, to determine the relative positions of the parts; and fastenings for securing the shafts and heads together.

- 5 5. The herein-described cylinder, consisting of shell or body 16; heads 15, provided with semicircular ribs or projections 17; disks 19, provided with short shafts or axles 22; bands or straps 21, applied to said disks; and

bolts connecting the disks and the cylinder- 10 heads, substantially as described and shown.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WILLIAM PHILLIPS ORMSBY.

Witnesses:

JAS. L. MCWHORTER,

JAS. A. BURROUGHS.