July 8, 1941. J. T. AULD 2,248,419

BLOCKING MACHINE

Filed Oct. 19, 1939 4 Sheets-Sheet 1

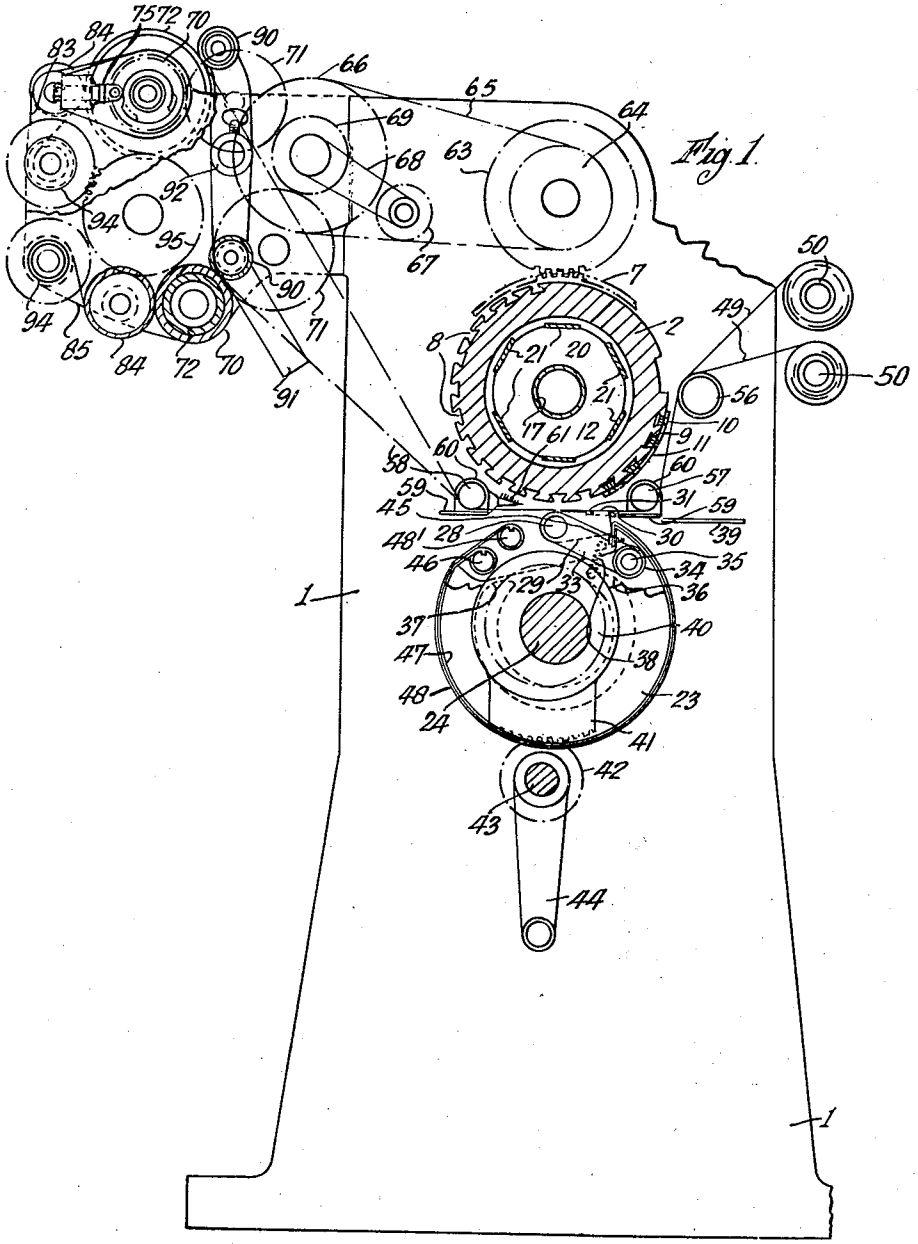


Fig. 1.

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BLOCKING MACHINE

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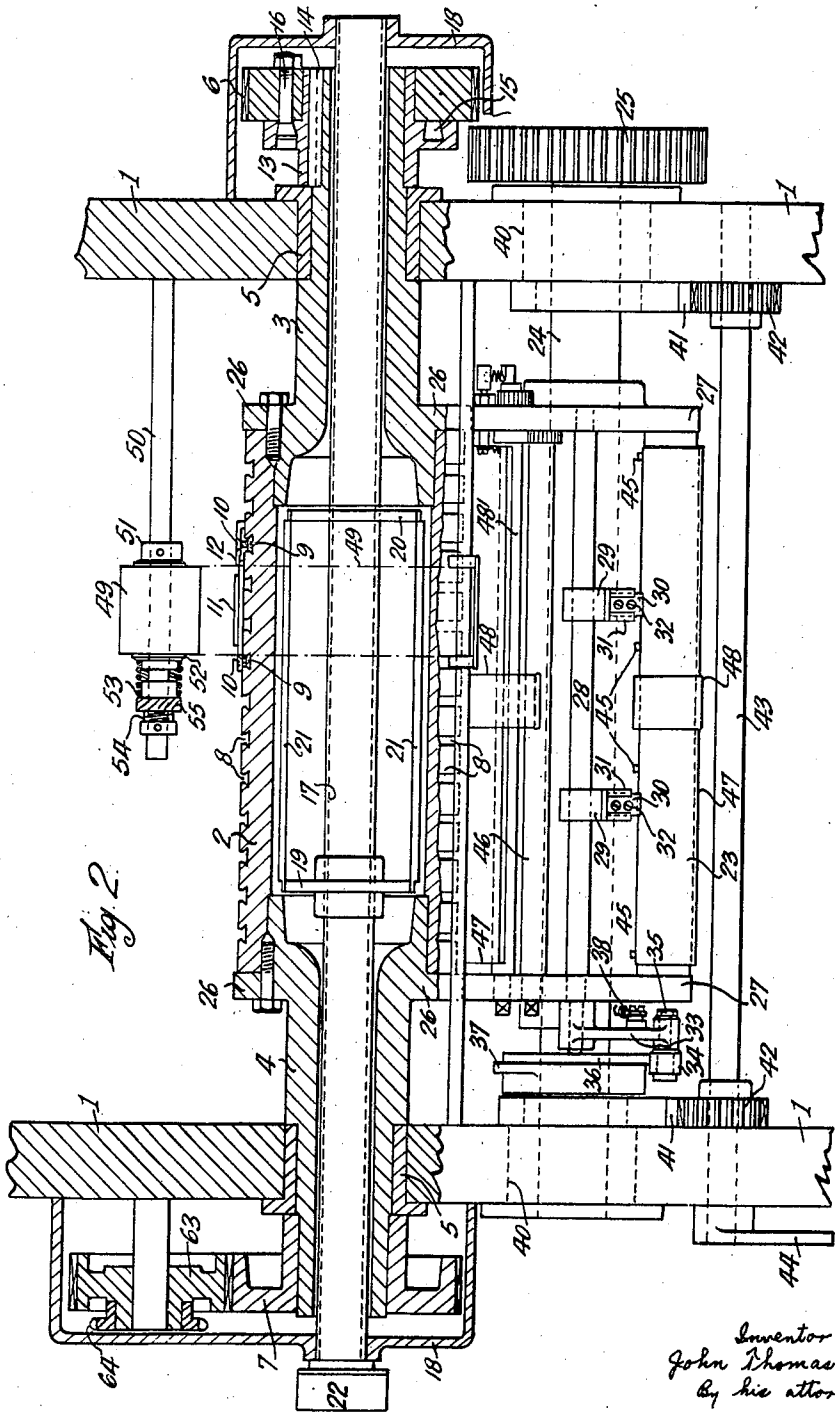


Fig. 2.

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BLOCKING MACHINE

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Fig. 3.

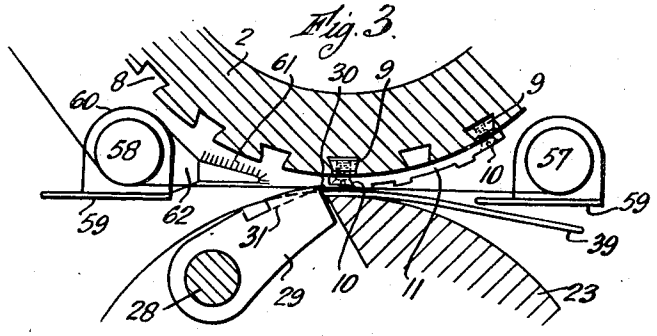
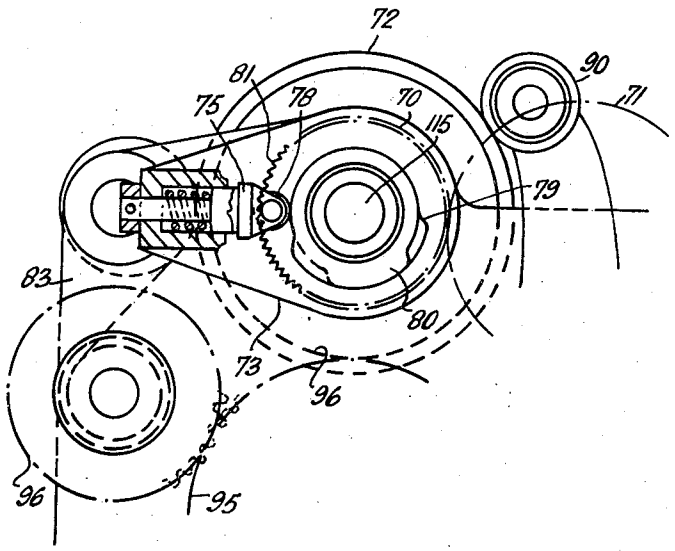


Fig. 6.



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BLOCKING MACHINE

Filed Oct. 19, 1939 4 Sheets-Sheet 4

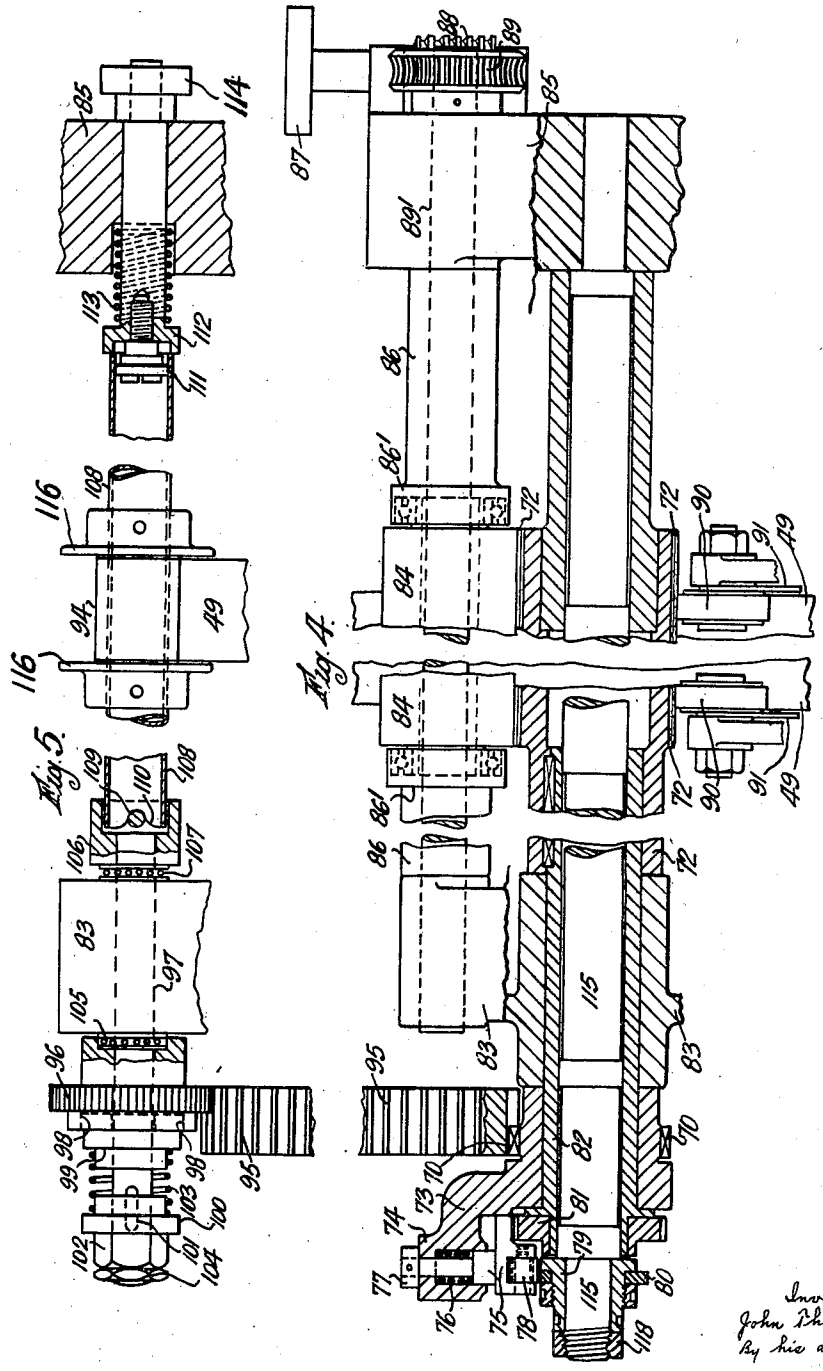


Fig. 4.

Fig. 5.

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Patented July 8, 1941 2,248,419

UNITED STATES PATENT OFFICE

2,248,419

BLOCKING MACHINE

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Application October 19, 1939, Serial No. 300,261
In Great Britain August 16, 1939

19 Claims. (Cl. 41—7)

This invention relates to blocking machines such as are employed in the bookbinding industry for the purpose of applying gold or foil blocking to book covers.

In the process of blocking such book covers it has been customary for a special feed device to draw gold or full ribbon (i. e. a backing in the form of a long strip carrying the gold or foil) between two flat platens, one platen carrying a flat die plate and the other platen carrying the book cover, when these platens have been separated. After the gold or foil ribbon has been fed by the feed device the platens come together in a face to face direction and under pressure so that the die plate embosses the gold or foil ribbon on the book cover all over the design of the die plate at the same instant; the two platens then being separated.

The main object of the present invention is to provide a rotary machine which will operate to block articles and more especially book covers in rapid succession with the use of gold or foil ribbon.

Generally regarded, a rotary blocking machine according to this invention comprises a die cylinder to carry one or more curved die plates and an impression cylinder, the article to be blocked being conveyed between the die cylinder and the impression cylinder as these cylinders rotate. The machine includes means so to guide a ribbon between the cylinders that as they rotate the ribbon is progressively gripped between the articles and the design on the die plate and is progressively advanced thereby as the blocking operation proceeds by the die plate acting through the ribbon to imprint or emboss its design in gold or foil on the article.

With such an arrangement only as much ribbon is advanced as is required by the design on the die plate. In short, the gold or foil ribbon is pulled through the machine by the die plate and the book cover coming on the gold or foil ribbon by rotary embossing contact with the said ribbons between the two rotating members. When several patterns are to be blocked as for example on the spine and front leaf of a book cover, separate ribbons could be employed, each ribbon being separately advanced depending on the different designs on the plate (or plates) for the spine and front leaf.

Mechanism is provided to take-up the ribbon as it is advanced by the co-operation between the die plate and the cover.

As the ribbon or the various ribbons is or are fed through the machine by the rotary action of the heated die plate coming into embossing contact with the backing material of the ribbon at the same instant as the book cover comes into rotary embossing contact with the gold or foil coated side of the backing, the rolling action of the rotary members permits of an improved finish to the surface of the gold or foil after the gold or foil has been deposited on the book cover.

By the use of the principle of rolling contact, the actual embossing contact is confined to one narrow surface at a given instant, thus limiting the resultant pressure on individual members to a small amount.

The die plate cylinder is arranged to enable a die plate or plates being fixed in different required positions; thus the surface of the die plate cylinder may be suitably grooved to allow of plate clamps being carried to fix die plates in various positions according to the size and design required on the blocked book cover. The die plate cylinder may be made hollow to accommodate suitably controlled heating elements within it so that the die plates will be heated to the required degree to enable the blocking to be successively carried out.

The impression cylinder is adjustable towards and away from the die plate cylinder so that various thicknesses of book covers can be embossed to any desired depth depending on the adjustment. The impression cylinder is covered by a blanket so fixed that the blanket can be suitably packed and made-ready to suit any design of blocking on the front or back of the book cover. A separate blanket may also be provided and packed and made-ready to suit any design of blocking on the spine of the book cover. The impression cylinder carries adjustable grippers to grip the covers and carry them around with the cylinder. The grippers are preferably operated by a cam runner and two separately adjustable cams may be arranged in such a manner that the said adjustable grippers are operated by the rotation of the impression cylinder round these cams. The book cover to be blocked is gripped by these adjustable grippers and carried sufficiently far round the impression cylinder to enable the heated die plates on the die plate cylinder to deposit their various designs through the various gold or foil ribbons on to the said book cover. Means may be provided to enable the die plate cylinder to be moved independently of the impression cylinder so as to bring the die plate or the various die plates into correct register on the gripped book cover. Immediately after the book cover is blocked the adjustable

grippers holding the book cover may be released by means of one of the adjustable cams.

Means may be provided to hold the gold or foil ribbon or ribbons in correct position or alignment to the rotating members described above before and after the blocking of a book cover takes place.

The take-up mechanism may operate to take up a ribbon or ribbons under an adjustable tension, and this take-up mechanism may include means for pulling the blocked portion of the ribbon or ribbons in such a manner that the blocked (i. e. used) ribbon is re-wound on separate bobbins.

Means may be provided to strip the gold or foil ribbon from the heated die plate and also to clean the heated die plate immediately after the heated die plate and the gold or foil ribbons have left the bookcover gripped by the impression cylinder after the blocking operation has been performed.

In order that the nature of this invention may be readily understood, reference will be made to one form of construction shown in the accompanying drawings, in which:

Figures 1 and 2 are respectively side and end elevations partly in section;

Figure 3 is an enlarged sectional view showing the die plate and the cover feeding the ribbon through the machine;

Figure 4 is an enlarged view of part of the ribbon take-up mechanism;

Figure 5 is an enlarged view of a re-wind or take-up spindle; and

Figure 6 is an enlarged end elevation partly in section of the take-up mechanism shown in Figure 1.

Referring to Figures 1 and 2, 1 indicates the main side frames of the machine, and 2 a hollow die plate cylinder having side flanges 26 and carried from the frame 1 by means of hollow gudgeon ends 3 and 4 through suitable bearing blocks 5. The gudgeon end 3 carries a spur gear 6 by which the die plate cylinder is driven and the gudgeon end 4 carries a spur gear 7 which drives the fold or foil ribbon take-up unit as hereinafter described. This gear 7 may also drive an inking mechanism for inking a die plate for embossing without the use of gold or foil. The cylinder 2 is grooved both horizontally and cylindrically with grooves 8 and nuts 9 are placed in position in the grooves and counter-sunk headed screws 10 are passed through die plate 11 and screwed into tapped holes in the nuts 9 causing the die plate 11 to become tightly clamped to the outer surface of cylinder 2. Any convenient number of die plates can be fixed at one time by this means. Die plates that cannot be fixed directly by screws 10 can be held by side clamps 12 clamped down by screws 10 screwing into the nuts 9. To enable the die plate cylinder 2 to be rotated independently of any other rotating part of the machine and so to enable the die plate 11 to be brought exactly into register with the book cover according to the various positions of the desired designs on the blocked book cover, the cylinder 2 can be freed from its driving gear 6. For this purpose a flanged sleeve 13 (Figure 2) is keyed to gudgeon end 3 by means of key 14 and the flange of the sleeve 13 is slotted circumferentially with a T-slot or, if preferred, a dove-tailed slot 15 which receives the head of bolts 16 passing through the gear 6 which is loose on the sleeve 13. To permit the cylinder 2 to be adjusted, the bolts 16 are slackened and after the necessary register adjustment is made to the die plate cylinder, the spur gear 6 is tightly clamped to the flange of sleeve 13 by tightening the bolts 16.

In order to heat the die plate 11, the following arrangement is employed: passing through the centre of the hollow die plate cylinder 2 is a stationary steel tube 17 supported beyond the outer gudgeon ends 3 and 4 by fixed brackets 18 which are preferably incorporated in the design as gear guards for the spur gears 6 and 7. Two discs 19 and 20 are carried by the tube 17, the disc 19 being held in position by two collars and the other disc 20 being mounted loosely on the tube 17. These discs 19 and 20 are spaced at each end of the die-carrying surface of the hollow die plate cylinder 2 and heating elements 21 are fixed transversely across the die plate cylinder bore by screws to discs 19 and 20. The heating elements 21 are wired through tube 17 to one outer fixed bracket 18 on which is fixed a heat controlling switch 22. Varying degrees of heat can be maintained by switch 22. As the disc 20 is loosely mounted on the tube 17, the discs can accommodate themselves to expansion due to varying temperatures.

Numeral 23 (Figures 1 and 2) indicates a suitably shaped impression cylinder which conveys the book cover through the machine. This cylinder 23 is fixed to a steel shaft 24 which projects through the side frames 1 and is supported in these frames by eccentric bearings 40. On the extended end of the shaft 24 is fixed a spur gear 25 which is driven from the main drive at the same speed as die plate cylinder 2 but in the opposite direction. A large groove is cast in cylinder 23 to accommodate gripper and blanket tensioning mechanism to be described. Side flanges 27 are fixed on each end of the cylinder 23 in such a manner that they come in rolling contact with the side flanges 26 on die plate cylinder 2. The cover to be blocked, shown at 39, is taken on the impression cylinders by grippers 29 on a shaft 28 which is pivotally mounted in the cylinder 23. The grippers are adjustable transversely along the shaft 28 and have gripper plates 30 which are adjustably mounted in dovetailed slots 31 on the grippers 29. The plates 30 are adjusted in the slots 31 to obtain the desired amount of overlap of the gripper plates 30 to ensure a firm grip on the book cover 39 and then the gripper plates 30 are secured firmly to the grippers 29 by screws 32. The ends of the shaft 28 are supported in the flanges 27, one end being extended to have a cam lever 33 secured to it. On the free end of the cam lever 33 is carried a rotating cam runner 34 on a bearing stud 35, this cam runner engaging side cams 36 and 37 as the cylinder 23 rotates. The cam 36 allows the runner to drop under the urge of a spring 38 which pulls on the lever 33, the gripper rod 28 being rocked thereby and the plates 30 pulled down on to the cylinder 23. The cam 36 is located to enable this to occur just at the exact moment when book cover 39 touches the end face of the grippers 29. By the rotation of cylinder 23, the gripped book cover 39 is drawn through the machine until the grippers 29 are released by the cam runner 34 coming into contact with release cam 37. Release cam 37 can be adjusted to allow for variations in lengths of various book covers used in the bookbinding industry.

For the purpose of enabling the impression cylinder 23 to be adjusted towards and away from the cylinder 2, gear quadrants 41 are fixed to

the eccentric bearings 40 in which the shaft 24 is mounted and these quadrants engage with spur gears 42, fixed to a cross shaft 43 carried through the side frames 1. On an extended end of the shaft 43 is fixed a suitable hand adjusting means such as the handle 44 so that by rotating the shaft 43 by hand, quadrants 41 are turned, thus causing the eccentric bearings 40 to rotate in the main frames 1. This action, according to the direction of rotation, moves the cylinder 23 towards or from the cylinder 2 to accommodate the passage through the machine of book covers of any thicknesses. The main body of the cylinder 23 is covered by a suitable blanket 47 fixed by several pegs 45 at one end and to a winding shaft 46 at the other end, the shaft 46 being controlled by ratchet and pawl mechanism similar to customary arrangements on various printing machines. A narrow blanket 48 is also carried around the cylinder 23 on the top of the blanket 47 and is fixed and controlled in exactly the same manner as particularly described for the blanket 47, a winding shaft 48' being employed and this narrow blanket being provided for blocking the spine of a book cover.

In the machine illustrated, provision is made for two separate gold or foil ribbons one for the front leaf of a cover and the other for the spine of the cover, although any desired number of ribbons may be used. As each ribbon is fed through by similar means, it will be sufficient to describe the means whereby one ribbon is fed through the machine, the corresponding parts for the two ribbons having similar reference numerals. A ribbon 49 is mounted in reel form on a pre-constructed bobbin on a graduated reel-off shaft 50. Ribbon 49 is correctly placed in its particular position relative to its particular die plate 11 fixed on the cylinder 2, by means of a fixed flange 51 on one side and a flange 52 on the other. The flange 52 is held in position by a spring 53 carried on a screwed sleeve 54 on which is a nut 55. By fixing the sleeve 54 to the shaft 50 and then screwing the nut 55 against the spring 53 suitable pressure is applied to the ribbon 49 through the flange 52 to enable the gold or foil ribbon to maintain a necessary tautness through the machine. Ribbon 49 is fed round a guide roller 56 and fixed smooth guide rods 57 and 58, so that the gold or foil ribbon passes exactly between cylinders 2 and 23 at the correct blocking level.

The guide stays 57 and 58 are so positioned that as the cylinders 2 and 23 rotate, the grippers gripping a cover 39, the heated die plate 11 will progressively grip the ribbon 49 between its design and the cover 39 and so will draw the ribbon through the machine as the rotary blocking operation proceeds, the gold or foil on the ribbon being at the same time deposited on the cover by the design on the die plate 11. The amount of ribbon drawn forward in this way will be only as much as is required for the blocking performed by the die plate 11 and where several die plates are employed, each having a separate ribbon, the various ribbons will be drawn forward an amount depending upon the extent of design on its own die plate.

To prevent the book cover 39 from hitting the ribbon 49 before and after the cover 39 is gripped by the gripper 29, the stays 57 and 58 have fixed to them metal slippers 59 held in position by collars 60. Further, to enable the gold or foil ribbon to be separated from certain types of die plate 11, a soft plush pad or deflector 61 is carried by the stay 58 fixed thereto by a suitable plate 62. This plush pad 61 will also clean the die plate 11 if it carries any deposit from the ribbon 49.

Mechanism for taking-up the ribbon paid out during the blocking operation will now be described. For each ribbon a similar mechanism is provided, so that the similar parts have similar reference numerals applied to them. Referring to Figures 1 and 2, the spur gear 7 meshes with a spur gear 63 to which is fixed a sprocket 64, which drives a sprocket 66 by chain 65 suitably tensioned by a sprocket 67 carried by a tension lever 68. A spur gear 69 is fixed to the sprocket 66 which drives a spur gear 70 through an idle spur gear 71. Spur gear 70 rotates reel-through roller 72 in a manner hereinafter described. The gear train is so designed that one revolution of the die plate cylinder 2 gives one revolution of the spur gear 70.

Referring now to Figures 1 and 4, the spur gear 70 rotates continuously with cylinders 2 and 23. Fixed to the gear 70 is a lever 73 shaped to provide a boss 74 which slidably supports a cam runner support and pawl 75. This is kept in correct working position by a coil compression spring 76 housed in the boss 74 and the support 75 is prevented from coming out of the boss 74 by a fixed collar 77. A cam runner 78 carried by the support 75 is operated by two stationary and separately adjustable cams 79 and 80, the cam 79 being fixed to a fixed shaft 115 by screwed nut 118, and the cam 80 being independently clamped to the cam 79. As the lever 73 rotates, the stationary cam 79 allows the cam runner support and pawl 75 to drop so that the pawl engages with a ratchet wheel 81. This ratchet wheel 81 is fixed to a sleeve 82 which is supported by a frame 83 and on the other end of sleeve 82 is fixed the reel-through roller 72 this roller being rubber coated to enable a good grip to be taken on the ribbon 49. Thus when the pawl 75 is allowed to engage the ratchet wheel 81 drive is transmitted from the gear 70 to the roller 72 and this roller operates to draw on the ribbon paid out during the blocking operation. A pressure roller 84 engages with roller 72. The adjustable cam 80 lifts the pawl 75 and so stops the rotation of rollers 72 and 84 after the amount of ribbon 49 fed through the machine, has been drawn through. This operation of the rollers 72 and 84 occurs of course once in each rotation of the lever 73 and hence in one rotation of the cylinders 2 and 23 which perform a blocking operation in each rotation. The amount of ribbon drawn on by the rollers 72 and 84 can be adjusted by adjustment of the cam 80 to suit the particular die plate in use. The ribbon 49 is now tightly stretched through the machine from the shaft 50 round roller 56, then round guide rods 57 and 58 and is now not in contact with any part of the rotating cylinders 2 and 23. The rollers 72 and 84 are also supported by a frame 85. The pressure roller 84 is carried in eccentric parts 86' on bushes 86 and the pressure is adjusted by a handwheel 87 to which is attached worm 88 meshing with wormwheel 89, connected to the eccentric bushes 86 through a shaft 89' supported in the frames 83, 85. Side runners 90 and flanges 91 are carried off a fixed rod 92 by levers 93, this arrangement ensuring that the blocked part of the ribbon 49 is guided correctly through rollers 72 and 84. The reel-through rollers 72 and 84 begin to rotate only after the die plate 11 on the cylinder 2 and the book cover 39 on cylinder 23 has started to feed ribbon

40 through the machine. No excessive tension is put on the blocked portion of the ribbon 49 between rollers 72 and 84 and the die plate 11 and book cover 39 when the plate 11 and cover 39 are in contact.

The various rollers 72 are of such diameter as enables them, in a part of a rotation depending on the particular setting of the cams 79, 80, to take up the amount of ribbon paid out by the appertaining die plate 11. For example, the upper roller 72 shown in Figure 1 may be used to take up ribbon paid out by the plate 11 to block the spine of the cover 39 and the lower roller 72 to take up the ribbon paid out by the plate 11 to block the front leaf of the cover. As the amount of ribbon used to block the spine generally is greater than the amount to block the front leaf, the upper roller 72 is made of larger diameter than the lower roller 72.

The amount of ribbon 49 fed through rollers 72 and 84 is now re-wound on a separate bobbin 94 by mechanism now to be described.

Referring to Figure 5, the spur gear 70 (shown in Figures 1 and 4) meshes with an idle spur gear 95 which drives a spur gear 96 continuously at a fast suitable speed. The spur gear 96 runs freely on one end of a shaft 97 and carries a leather disc 98, this disc being in frictional engagement with a flange 99 fast on the shaft 97. A sleeve 100 is slidable on shaft 97 and drives it through a key 101. The end of the shaft 97 is threaded to carry a nut 102 which can push sleeve 100 up against a spring 103 to increase or decrease the friction between disc 99 and leather disc 98 according to the strength of ribbon 49, a lock nut 104 being provided to clamp the nut 102 in its fixed position when the correct friction pressure has been found. A ball thrust bearing 105 is inserted between the spur gear 96 and the frame 83. The other end of the shaft 97 carries a recessed collar 106, and this collar is recessed to take a hollow detachable rewinding shaft 108 which is driven by means of a peg 109 fixed in the sleeve 106 and engaging in a slot 110 in the end of the shaft 108. The other end of shaft 108 is supported by means of a brass stud 111 screwed into a head on a supporting shaft 112 extending through the frame 85 which in turn is counterbored to hold a compression spring 113 which reacts against the head of shaft 112 to bias the tube 108 so that the slot 110 is releasably held in driving engagement with the pin 109. The head on the shaft 112 is prevented from so bearing on the end of the hollow re-wind shaft 108 as to cause undue friction by means of a collar 114 fixed on other end of the shaft 112 and bearing against the side of frame 85. Between the collar 106 and the frame 83 is a ball thrust bearing 107 which takes the thrust from the spring 113. On the shaft 108 are fixed two adjustable collars 116 which bear on the re-winding bobbin 94 and so cause it to rotate. When now the ribbon 49 begins to be passed on by the rollers 72 and 84 the re-wind bobbin 94 is rotated by the friction between the leather disc 98 on the constantly rotating gear 95 and friction flange 99. When the ribbon 49 passed on by the rollers 72 and 84 has been re-wound on to the bobbin 94 the strength of the ribbon holds the re-winding shaft 108 and the driving means as far as friction flange 99 stationary, thus causing the leather disc 98 to slip on the flange 99 until further ribbon is passed on by the rollers 72 and 84. The re-winding shaft 108 and reel-off shaft 50 are both graduated by a marked scale to facilitate the rapid horizontal placing of the ribbon 49 when threading the ribbon 49 through the machine before the operation of blocking is begun.

When it is desired to remove the re-wound bobbin 94, the shaft 108 is moved endwise to the right (as seen in Figure 5) against the spring 113 so as to carry the left-hand end of the shaft 108 clear of the sleeve 106. The shaft 108 can then be moved clear of the stud 111 and the bobbin removed.

What I claim is:

1. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, and means so to guide a blocking ribbon between the cylinders that as the cylinders rotate the ribbon is gripped between the die plate and the article and advanced to an extent dependent on the pattern on the die plate at the same time as the pattern is blocked on the article through the ribbon.

2. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a source of blocking ribbon supply, and means guiding ribbon from the supply freely between the cylinders so that as the cylinders rotate the ribbon is gripped between the pattern on the plate and the article and advanced as the blocking operation proceeds.

3. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, a ribbon take up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate, and means to operate the take-up spool to take-up ribbon paid-out by co-operation between the plate and article.

4. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, means to tension the supply spool, a ribbon take up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate and drive mechanism to drive the take-up spool to rewind ribbon paid out by co-operation between the die plate and the article during the blocking operation.

5. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, means to tension the supply spool, a ribbon take up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate and

drive mechanism to drive the take-up spool to rewind ribbon paid out by co-operation between the die plate and the article during the blocking operation, the said drive mechanism including a driving member constantly driven with the die and impression cylinders, and a slipping clutch connecting the driving member to the take-up spool.

6. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, means to tension the supply spool, a ribbon take up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate and drive mechanism to drive the take-up spool to rewind ribbon paid out by co-operation between the die plate and the article during the blocking operation, the said drive mechanism including pressure rollers between which biocked ribbon passes to the take-up spool from the cylinders, a positive drive mechanism to drive the rollers, and means to adjust the drive mechanism to rotate the rollers through adjustable angular extents.

7. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, means to tension the supply spool, a ribbon take up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate and drive mechanism to drive the take-up spool to rewind ribbon paid out by co-operation between the die plate and the article during the blocking operation, the said drive mechanism including pressure rollers between which blocked ribbon is taken from the cylinders to the take-up spool, a positive drive mechanism to drive the rollers, means to adjust the drive mechanism to rotate the rollers through adjustable angular distances, and a slipping clutch arrangement to drive the take-up spool.

8. A blocking machine comprising in combination a die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders and means so to guide a plurality of blocking ribbons, one for each section and pattern that as the cylinders rotate the respective ribbons are gripped between the corresponding pattern areas and the article so that the respective ribbons are respectively advanced to an extent dependent on the appertaining pattern, the pattern being at the same time blocked on the article through the ribbon.

9. A blocking machine comprising in combination a die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders, a plurality of sources of blocking ribbon supply, one source being provided for each pattern area, and means guiding the ribbons from the supply sources freely between the cylinders so that as the cylinders rotate the ribbons are respectively gripped between the appertaining pattern areas on the die plate means and the article and are advanced thereby as the blocking operation proceeds.

10. A blocking machine comprising in combination a die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders, a plurality of blocking ribbon supply spools one for each pattern area of the die-plate means, a corresponding plurality of take-up spools, the ribbons being taken from the supply spools then between the cylinders to the appertaining take-up spool so that the ribbons are respectively engaged between the appertaining pattern area of the die plate means and the article as the cylinders rotate, and means to operate the take-up spools to take-up ribbon paid-out by co-operation between the respective pattern areas and the article.

11. A blocking machine comprising in combination a die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders, a plurality of blocking ribbon supply spools one for each pattern area of the die-plate means, a corresponding plurality of take-up spools, the ribbons being taken from the supply spools then between the cylinders to the appertaining take-up spool so that the ribbons are respectively engaged between the appertaining pattern area of the die plate means and the article as the cylinders rotate, and means to operate the take-up spools to take-up ribbon paid-out by co-operation between the respective pattern areas and the article, said operating means including for each take-up spool a driving member constantly driven with the die and impression cylinders, and a slipping clutch connecting the driving member to the take-up spool.

12. A blocking machine comprising in combination a die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders, a plurality of blocking ribbon supply spools one for each pattern area of the die-plate means, a corresponding plurality of take-up spools, the ribbons being taken from the supply spools then between the cylinders to the appertaining take-up spool so that the ribbons are respectively engaged between the appertaining pattern area of the die plate means and the article as the cylinders rotate, and means to operate the take-up spools to take-up ribbon paid-out by co-operation between the respective pattern areas and the article, said operating means including for each take-up spool pressure rollers between which blocked ribbon passes to the take-up spool from the cylinders, a positive drive mechanism to drive the rollers, and means to adjust the drive mechanism to rotate the rollers through adjustable angular extents.

13. A blocking machine comprising in combination a hollow die cylinder, a curved die-plate on the cylinder, means within said hollow cylinder to heat the die plate, an impression cylinder, means to rotate the cylinders, means to convey

an article to be blocked between the cylinders, as they rotate, and means so to guide a blocking ribbon between the cylinders that as the cylinders rotate the ribbon is gripped between the die plate and the article and advanced to an extent dependent on the pattern on the die plate at the same time as the pattern is blocked on the article through the ribbon.

14. A blocking machine comprising in combination a hollow die cylinder, a curved die-plate on the cylinder, means within said hollow cylinder to heat the die plate, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, a ribbon take-up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate, and means to operate the take-up spool to take-up ribbon paid-out by co-operation between the plate and article.

15. A blocking machine comprising in combonation a hollow die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, means within said hollow cylinder to heat the die plate, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders, and means so to guide a plurality of blocking ribbons, one for each section and pattern, that as the cylinders rotate the respective ribbons are gripped between the corresponding pattern areas and the article so that the respective ribbons are respectively advanced to an extent dependent on the appertaining pattern, the pattern being at the same time blocked on the article through the ribbon.

16. A blocking machine comprising in combination a hollow die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, means within said hollow cylinder to heat the die plate, an impression cylinder, means to rotate the cylinders, means to convey an article to be blocked at different sections between the cylinders, a plurality of blocking ribbon supply spools one for each pattern area of the die-plate means, a corresponding plurality of take-up spools, the ribbons being taken from the supply spools then between the cylinders to the appertaining take-up spool so that the ribbons are respectively engaged between the appertaining pattern area of the die plate means and the article as the cylinders rotate, and means to operate the take-up spools to take-up ribbon paid-out by co-operation between the respective pattern areas and the article.

17. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, gripper means on said impression cylinder to convey an article to be blocked between the cylinders as they rotate, and means so to guide a blocking ribbon between the cylinders that as the cylinders rotate the ribbon is gripped between the die plate and the article and advanced to an extent dependent on the pattern on the die plate at the same time as the pattern is blocked on the article through the ribbon.

18. A blocking machine comprising in combination a die cylinder, a curved die-plate on the cylinder, an impression cylinder, means to rotate the cylinders, gripper means on said impression cylinder to convey an article to be blocked between the cylinders as they rotate, a blocking ribbon supply spool, a ribbon take-up spool, the ribbon being taken from the first spool, between the two cylinders and thence to the take-up spool so that the ribbon is engaged between the die-plate and the article as the cylinders rotate, and means to operate the take-up spool to take-up ribbon paid-out by co-operation between the plate and article.

19. A blocking machine comprising in combination a die cylinder, curved die-plate means on said cylinder and providing a plurality of different pattern areas, an impression cylinder, means to rotate the cylinders, gripper means on said impression cylinder to convey an article to be blocked at different sections between the cylinders and means so to guide a plurality of blocking ribbons, one for each section and pattern, that as the cylinders rotate the respective ribbons are gripped between the corresponding pattern areas and the article so that the respective ribbons are respectively advanced to an extent dependent on the appertaining pattern, the pattern being at the same time blocked on the article through the ribbon.

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