March 4, 1958 A. J. SCHWISOW 2,825,278

PRINTING DEVICE

Filed July 7, 1955 5 Sheets-Sheet 1

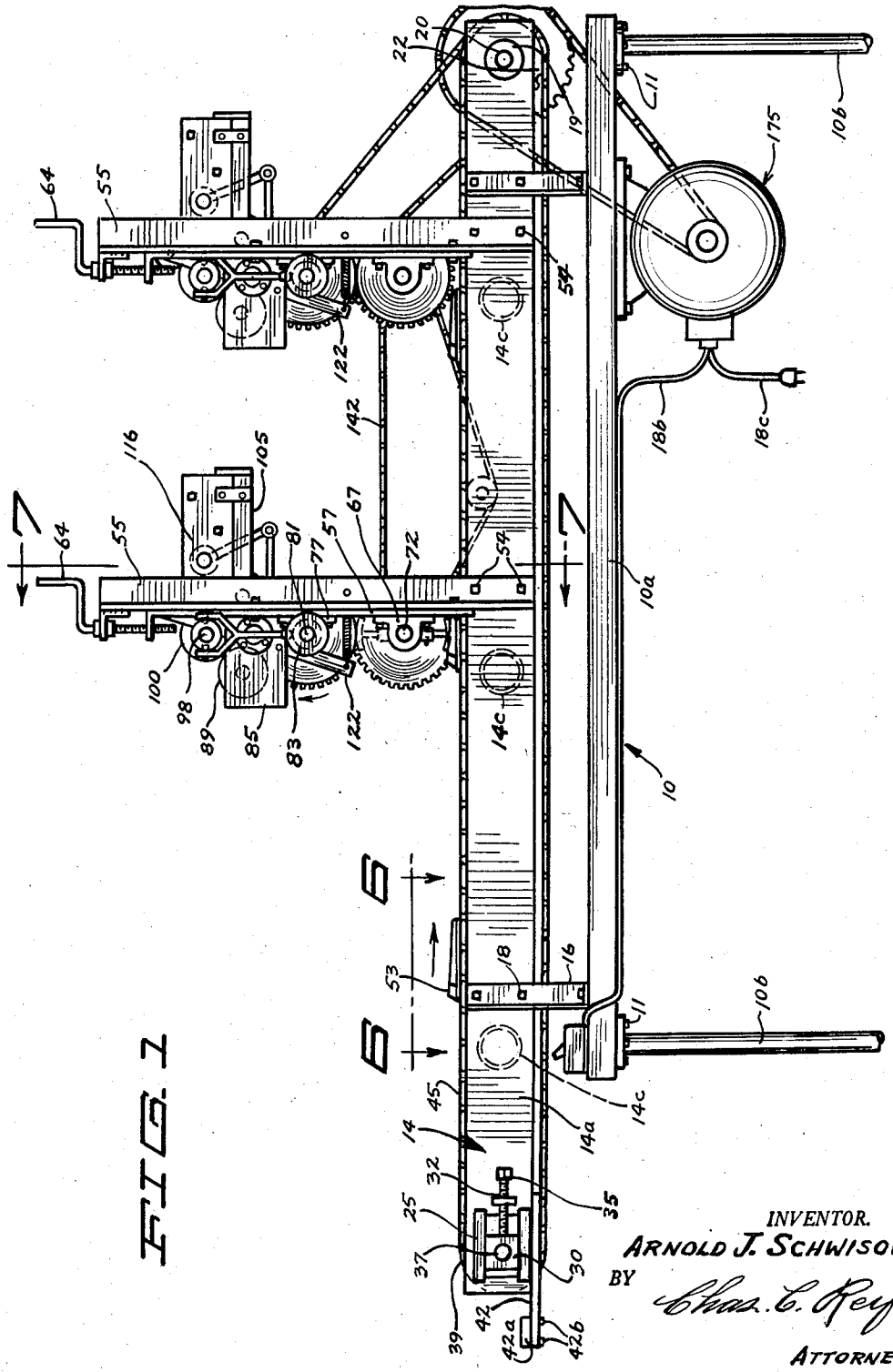


FIG. 1

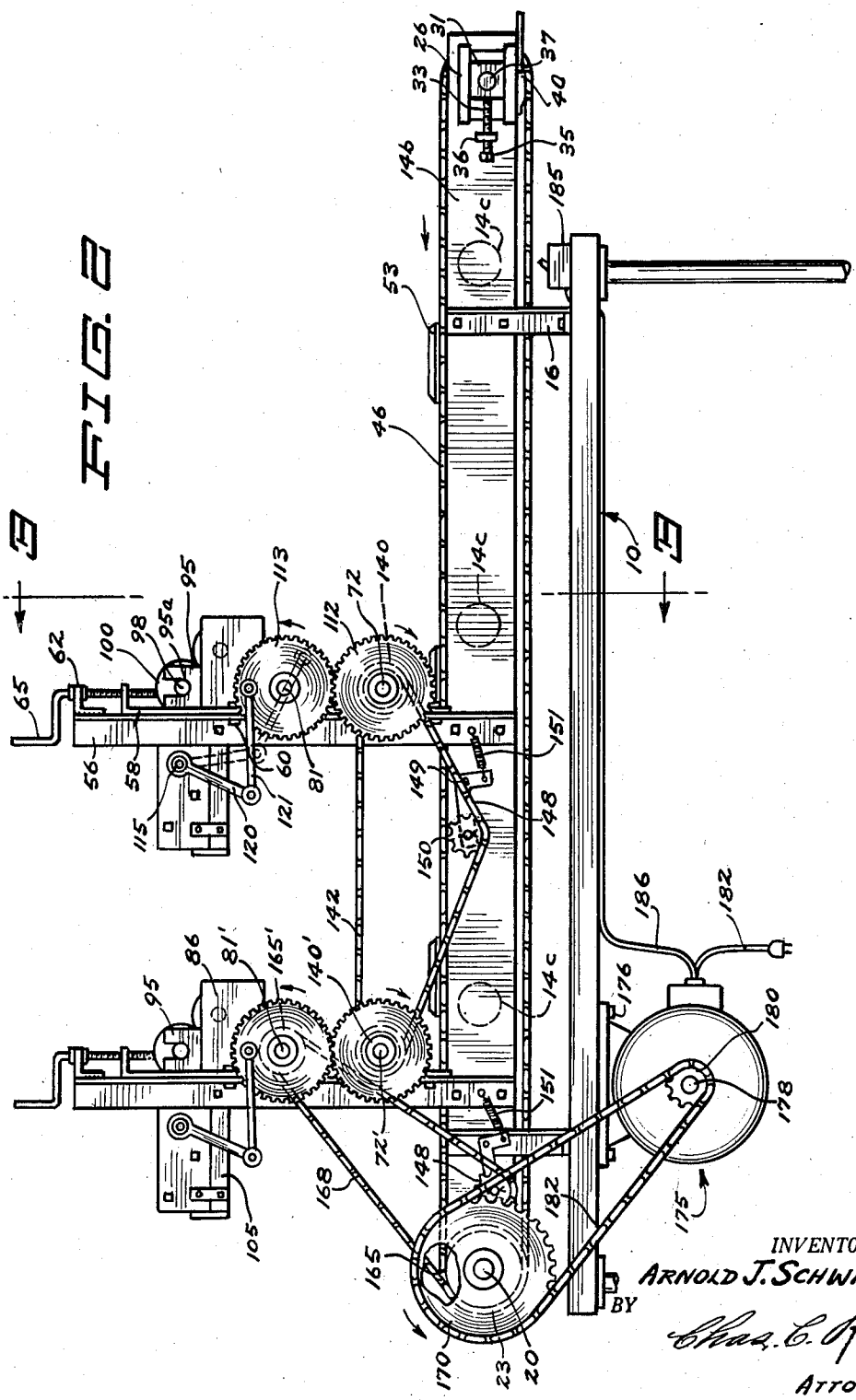
INVENTOR.
ARNOLD J. SCHWISOW
BY Chas. C. Reif.
ATTORNEY

March 4, 1958 A. J. SCHWISOW 2,825,278

PRINTING DEVICE

Filed July 7, 1955 5 Sheets-Sheet 2

FIG. 2

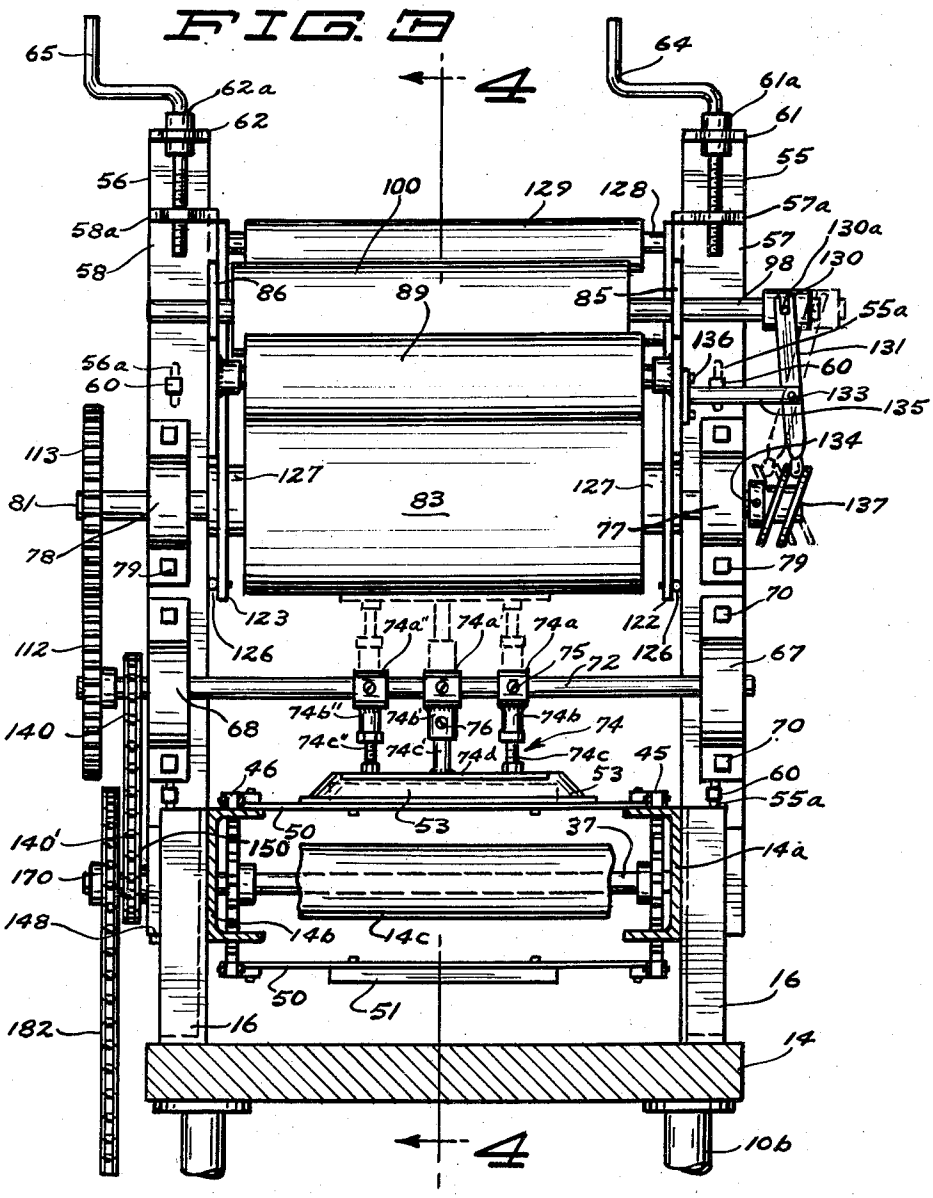


March 4, 1958 A. J. SCHWISOW 2,825,278

PRINTING DEVICE

Filed July 7, 1955 5 Sheets-Sheet 3

FIG. 3



INVENTOR.
ARNOLD J. SCHWISOW
BY
Chas. C. Reif
ATTORNEY

March 4, 1958 A. J. SCHWISOW 2,825,278

PRINTING DEVICE

Filed July 7, 1955 5 Sheets-Sheet 4

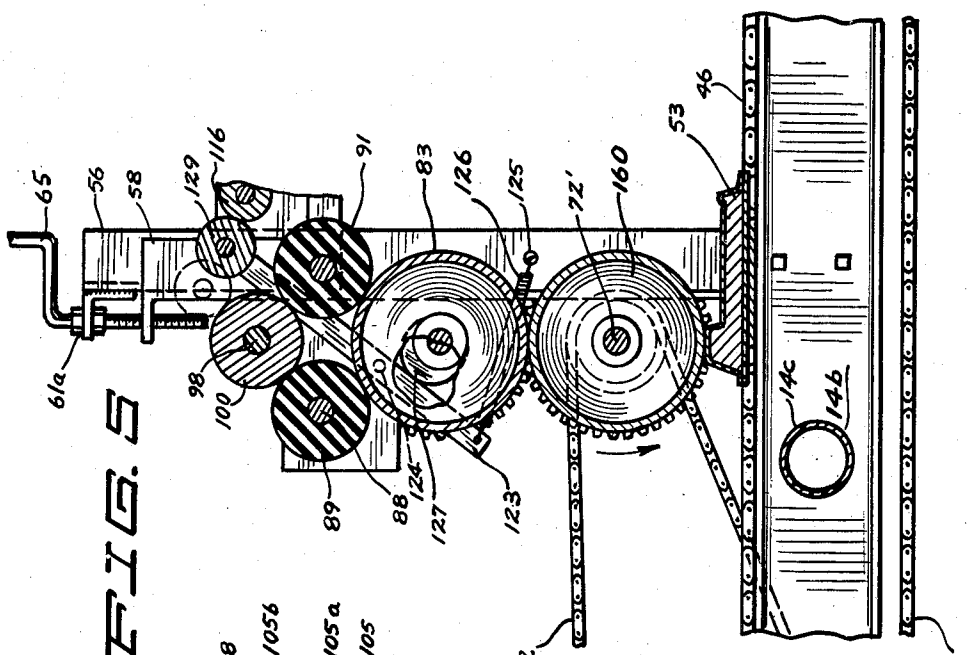


FIG. 5

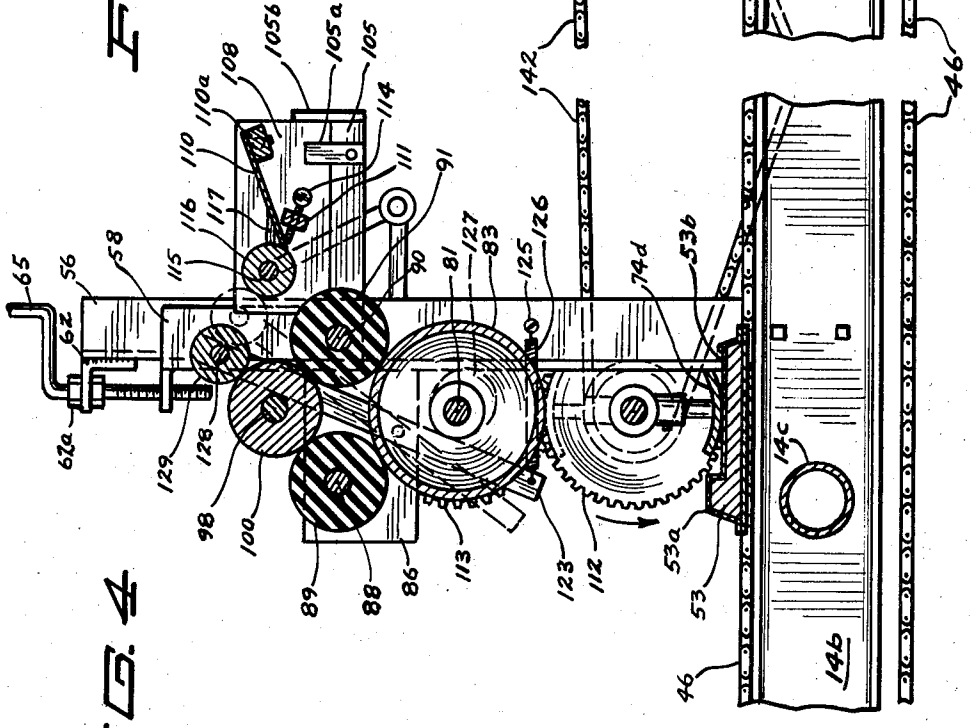


FIG. 4

INVENTOR.
ARNOLD J. SCHWISOW
BY
Chas. C. Reif
ATTORNEY

March 4, 1958 A. J. SCHWISOW 2,825,278

PRINTING DEVICE

Filed July 7, 1955 5 Sheets-Sheet 5

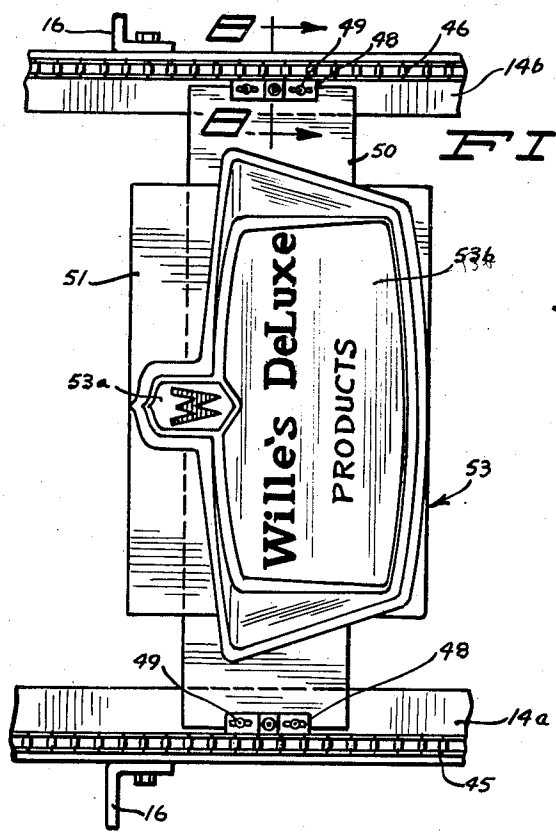


FIG. 6

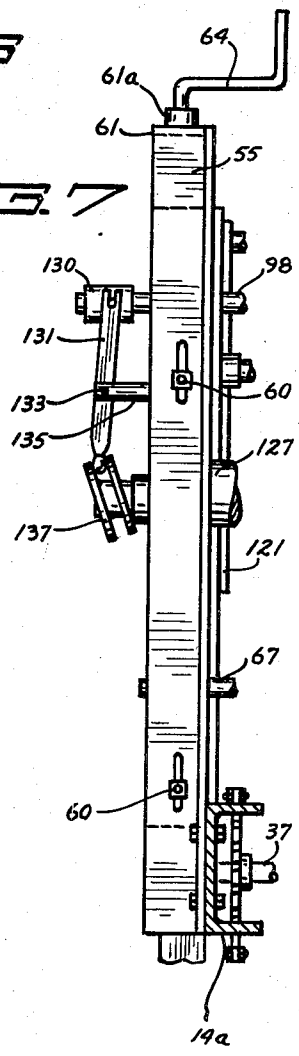


FIG. 7

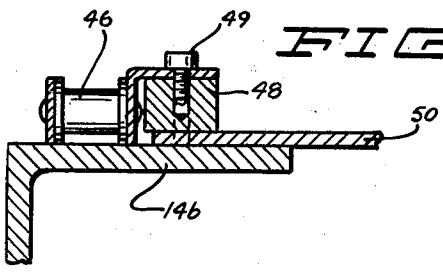


FIG. 8

INVENTOR.
ARNOLD J. SCHWISOW
BY Chas. C. Reif
ATTORNEY

United States Patent Office

2,825,278

Patented Mar. 4, 1958

2,825,278

PRINTING DEVICE

Arnold J. Schwisow, Hopkins, Minn.

Application July 7, 1955, Serial No. 520,576

6 Claims. (Cl. 101—35)

This invention relates to a machine for making impressions, such as colored impressions on surfaces, and particularly on surfaces lying in several different planes on a piece of work having such surfaces. Said invention also relates to a machine for making indentations on said surfaces.

It is the present practice to use a job printing press for applying colors to an object. Such a machine can be used only to apply a single color at one time to a surface and can only make such an impression on a surface lying in a single plane. Successive independent operations are therefore required for each color applied to a surface and for each plane in which surfaces may lie. This results in a considerable duplication of effort with the work being printed upon having to be handled for each separate operation. Such duplication of effort can be eliminated or avoided by the application of a plurality of colors at one time to a surface lying in a single plane or to surfaces lying in a plurality of planes. It is desirable therefore to have a machine which can make such an application of color.

It is an object therefore of this invention to provide a machine adapted to make impressions on a surface or on a number of surfaces lying in different planes in a single complete operation.

It is an other object of this invention to provide a machine having a plurality of means for respectively applying colors to a surface of a piece of work and a member for moving said work so as to be successively operated upon by said means.

It is also another object of this invention to provide a machine as set forth in the preceding paragraph, and means for holding said first mentioned means in different vertical positions for applying said colors to surfaces on the work disposed in different planes.

It is still another object of this invention to provide a machine for applying colors to surfaces of a piece of work, which surfaces lie in different planes, comprising spaced means for respectively applying said colors to said surfaces, means for moving said object to be successively operated on by said means, and means for operating said last mentioned means.

It is a further object of this invention to provide a machine having spaced means for respectively applying colors to a plurality of surfaces of a piece of work lying in a plurality of planes in a single complete operation and movable in paths to engage said work, an endless member for moving said work so as to be successively operated upon by said means, and means for operating said endless member and said means.

It is a more specific object of this invention to provide a machine for applying colors to surfaces of a piece of work in a plurality of different planes comprising a supporting member, members in spaced relation carried by said supporting member and movable in paths for respectively applying colors to said surfaces, means for respectively holding said spaced members in different

vertical positions so as to operate on surfaces in different planes of said work, an endless member moving about said supporting member for moving said work to be successively operated upon by said spaced members, and means for operating said endless member and said spaced members.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a view in side elevation showing some portions in different positions in dotted lines and showing some portions in dotted lines;

Fig. 2 is a side view in elevation similar to Fig. 1 looking at the other side of the device;

Fig. 3 is a view in partial vertical section and in partial end elevation with some parts shown in different positions by dotted lines;

Fig. 4 is a view in vertical section taken on line 4—4 of Fig. 3, as indicated by the arrows;

Fig. 5 is a view similar to Fig. 4 showing a rearward set of rollers used;

Fig. 6 is a top plan view as seen from line 6—6 of Fig. 1, as indicated by the arrows;

Fig. 7 is a partial vertical section on an enlarged scale taken on line 7—7 of Fig. 1, as indicated by the arrows; and

Fig. 8 is a partial view in horizontal section on an enlarged scale taken on line 8—8 of Fig. 6, as indicated by the arrows.

With reference to Figs. 1 and 2, a supporting member 10 is provided, here disclosed as being generally rectangular in plan and having a top portion 10*a* supported by leg members 10*b* secured thereto by bolts 11.

Resting on said member 10 is a frame member 14 shown here as comprising spaced side channel members 14*a* and 14*b*. Said members 14*a* and 14*b* are held in horizontal alignment in parallel spaced relation by connecting members 14*c*. Said connecting members are here disclosed as being cylindrical in form and are respectively secured at their ends to said side members in any suitable manner, as by welding. Said member 14 is supported above said member 10 by spaced supporting members 16. Said supporting members are respectively secured to members 14*a* and 14*b* and to top portion 10*a* by bolts 18.

Journaled in one end of said member 14 in bearings 19 is a shaft 20. Secured to said shaft adjacent the inner sides of members 14*a* and 14*b* respectively are sprockets 22 and 23. Said shaft 20 has an end portion extending outwardly of said side portion 14*b*.

Secured to the other end of said member 14 at the outer sides of said side members 14*a* and 14*b* are guide members 25 and 26 respectively. Said guide members may be secured in any suitable manner, as by welding. Slidable in said guide members 25 and 26 are bearing boxes 30 and 31 respectively. Adjusting screws 32 and 33 are provided movable through nuts 35 and 36 secured to said side members 14*a* and 14*b* for sliding adjustment of said bearing boxes. Journaled in said bearing boxes is a shaft 37. Secured to said shaft inwardly of said side members 14*a* and 14*b* are sprockets 39 and 40. A plate member 42 is secured to said last mentioned end of said member 14 and extends rearwardly thereof having a block member 42*a* secured at its outer end by bolts 42*b*. Said member 42 provides support for the operator of applicant's device.

Passing over sprockets 22 and 39 is an endless link chain 45. Passing over sprockets 23 and 40 is another endless link chain 46. Referring to Fig. 6, integral with

some of the links of said endless chains **45** and **46** and extending inwardly thereof at spaced intervals are a plurality of aligned pairs of lugs **48**. Removably secured to pairs of said lugs by thumb screws **49** are plate members **50**. Said plate members are here disclosed as being of sheet metal material and are adapted to carry thereon a jig **51** for supporting and carrying the work to be acted upon and said work is here illustrated as member **53**. Said jig will be changed as necessary to support the various kinds of work which may be carried thereon. Said member **53** as here disclosed has a surface **53***a* in one plane and a surface **53***b* in a lower plane. In the embodiment of the invention here illustrated, only colored ink is indicated as being applied to the indicia shown on each of said surfaces.

Upstanding from said member **14** and secured to the sides thereof are a pair of angle members **55** and **56**. Said angle members are positioned to have a pair of sides facing forwardly, which is to the left as viewed in Fig. 1, and their other sides facing one another. Said angle members are respectively secured to said sides **14***a* and **14***b* by bolts **54**. Overlying and slidably secured to said members **55** and **56** are angle members **57** and **58** of substantially the same width as said upstanding members and extending over a substantial portion of the height thereof. Said angle members **57** and **58** have upper end portions **57***a* and **58***a* bent outwardly at right angles. Said end portions **57***a* and **58***a* will be tapped. Said forwardly facing sides of said members **55** and **56** have vertically spaced slots **55***a* and **56***a* therein. Said plate members are secured to said upstanding members by bolts **60**. Said bolts will pass through said slots and will be movable upwardly and downwardly therein. Right angled brackets **61** and **62** are respectively secured, as by welding, to the upper ends of face portions **55** and **56**. The horizontal portions of said brackets will have collars **61***a* and **62***a* secured therein, and the openings in said collars will be in vertical alignment with the tapped portions of portions **57***a* and **58***a*. Crank members **64** and **65** are provided having right angled handle portions and threaded lower end portions. Said crank members will be respectively disposed through members **61***a* and **62***a* and they will be threaded into portions **57***a* and **58***a*.

Secured to the lower end portions of said members **57** and **58** are bearing blocks **67** and **68** secured to said plate members by bolts **70**. Journaled in said bearing blocks is a shaft **72**. Said shaft has an end portion extending outwardly of said bearing block **68**. Carried on said shaft is a printing member **74**. Said printing member may be variously constructed but is here illustrated as comprising a plurality of collars **74***a*, **74***a'* and **74***a''*. Said collars will be secured to said shaft **72** by set screws **75**. Said collars have nipples **74***b*, **74***b'* and **74***b''* secured thereto. Said nipple **74***b'* has a tubular member **74***c'* slidable therein with a set screw **76** provided for holding the same in a desired position. Carried by said member **74***c'* and integral therewith is an impression member **74***d*. Said impression member may be variously formed. It may be specifically adapted to contact a recessed surface. The same will describe a path about said shaft **72** and may be interchanged with other such members of greater or lesser width or length. Said member **74***d* as here disclosed is of rather narrow width describing a slight arc in traverse section. Said members **74***b* and **74***b''* are tapped and have threaded therein supporting members **74***c* and **74***c''* here disclosed as being bolts with hexagonal shaped heads adapted to be positioned tightly against the end portions of said platen to hold the same rigidly in position. With reference to Fig. 3, said member **74***d* is shown in operating position for making an impression or applying color to said work object **53**.

Secured to said angle members **57** and **58** above said bearing blocks **67** and **68** are another pair of bearing blocks **77** and **78** held in position by bolts **79**. Journaled in said last mentioned bearing blocks is a shaft **81**. Said shaft has its end portions extending outwardly of said bearing blocks. Secured on said shaft **81** is a roller **83**. Said roller as here disclosed is of substantial diameter and is positioned to be contacted by said impression member **74***d*. Said roller is preferably made of resilient material, such as rubber, as it functions to apply ink or other coloring material to said impression member.

Secured to the inner or facing sides of plate members **57** and **58** somewhat above shaft **81** are a pair of rectangular plate members **85** and **86** extending to one side of said members **55** and **56**. Journaled between said plate members is a shaft **88** and secured on said shaft is a roller **89**. Said roller is positioned to contact the periphery of said roller **83**. Spaced inwardly of said shaft **88** and in the same horizontal plane is a shaft **90** journaled between said members **55** and **56** and having a roller **91** secured thereto. Said roller **91** is also adapted to contact the periphery of said roller **83**. Respectively secured to said members **57** and **58** adjacent the upper portions of members **86** and **87** are a pair of brackets **95** respectively having open slotted bearings **95***a* therein. Journaled in said open slotted bearings is a shaft **98** having secured thereto a roller **100**. Said roller **100** is positioned to contact the peripheries of both said rollers **89** and **91**. Said roller **100** will be frictionally rotated by said rollers **89** and **91**.

Secured to said members **57** and **58** adjacent the upper end portions thereof and extending rearwardly thereof in the direction opposite that of said plate members **85** and **86** is a bracket **105**. Said bracket has upstanding supporting members **105***a* and **105***b* at the sides and rear respectively thereof. Carried by said bracket is an inking fountain comprising a rectangular member **108** having sides and a bottom. Positioned within and extending across said member **108** at a downwardly inclined angle is an ink holding member **110**. Said member **110** is swingably held in position by a bracket **110***a*. Secured to either side of said member **108** are nuts **111** and disposed in said nuts are adjusting screws **114** for positioning the lower end of said member **110** upwardly or downwardly.

Secured to an outer end portion of shaft **72** which will be its left end as viewed in Fig. 3, is a sprocket **112**. Secured also to the left outer end of shaft **81**, as viewed in Fig. 3, is a sprocket **113**. Said sprockets **112** and **113** are adapted to mesh.

Journaled in the sides of said member **108** is a shaft **115** having secured thereon an inking roller **116** of quite small diameter. Said plate **110** will be positioned to have said roller **116** contact its end portion and particularly the ink or coloring material **117** carried on said plate member and which accumulates at its lower end, as illustrated in Fig. 4. A lever **120** is secured to said shaft **115**. The means for connecting said lever to said shaft forms a ratchet, such as is in common use and is not here illustrated. An arm **121** is connected to said lever at one end and is connected to sprocket **113** adjacent the periphery thereof at its other end whereby with each rotation of said sprocket **113** said roller **116** will be moved a short distance of its circumference. This is a common and well known structure in the printing art.

Levers **122** and **123** of some length are respectively pivoted at points below their centers to plate members **86** and **87** by members **124** here disclosed as being nutted bolts. Coiled springs **126** are provided respectively having one end secured to the lower ends of said members **122** and **123** and having their other ends secured by screws **125** to members **57** and **58** respectively. Secured to shaft **81** adjacent either end portion thereof and positioned to engage said members **122** and **123** are eccentric cams **127**. Journaled between the upper ends of said

levers 122 and 123 is a shaft 128 having secured thereto transfer roller 129. Said levers will be oscillated by said eccentric cams and said transfer roller will be oscillated from contact with inking roller 116 to said roller 100 for transferring ink.

Secured to the right end portion of shaft 98, as viewed in Fig. 3, is a collar 130. Extending outwardly at either side of said collar is a pin 130*a*. A Y-shaped lever 131 is provided having bifurcated upper end portions at either side of said collar into which said pin 130*a* is received. Said lever is fulcrumed at approximately its midpoint by a pivot 133 to a bracket 135. Said bracket is secured by bolts 136 to plate member 87. Secured to the right outer end portion of shaft 81, as viewed in Fig. 3, is a rotary cam 137. The lower end portion of said lever 131 is here shown as being substantially ball-shaped and is positioned in said cam to be held therein whereby said lever is oscillated as said cam is rotated. Said lever will then move roller 100 from side to side.

Secured on shaft 72 adjacent the inner side of sprocket 112 is a sprocket 140 of rather small diameter. Passing over said sprocket 140 is a link chain 142. Said chain will pass over another sprocket 140' to be described. An idler is provided to take up the slack in said chain. Said idler as here disclosed comprises an L-shaped lever 148 pivoted to member 14*b* by a bolt 149. At the longer end of said lever is a small sprocket 150. Said sprocket engages said chain 142. A coiled spring 151 is secured at one end to the other end of said lever 148 and at its other end to said member 14*b*. Said spring will apply tension against said lever 148 to urge said sprocket 150 downwardly against said chain 142.

There may be two or more pairs of upstanding members 55—56 with parts carried thereon identical to those above described, and each of such assemblies is here referred to as a printing element. In the embodiment of the invention here disclosed there are two printing elements, the second of which is spaced rearwardly of said above described printing element. The parts of said second printing element are identified by the same characters as are the parts of said first printing element with the exception that an impression roller 160 is provided in place of said impression member 74*d*. Said impression roller is secured on shaft 72 and is preferably formed of a resilient material and is particularly adapted to apply color to a surface. Shaft 72' is identical to shaft 72 and has secured thereon a sprocket 140'.

Adjacent sprocket 23 secured on shaft 20 is a sprocket 165 of substantially the same diameter. A shaft 81' is provided identical to shaft 81 but having secured thereon a sprocket 165'. A link chain 168 will pass over said sprockets 165 and 165'. A second idler identical to the first one described is provided to take up the slack in said chain 168. Secured to an outer end portion of said shaft 23 is a sprocket 170 of rather large diameter.

Mounted to the under side at the rear of said member 10 is an electrical motor 175 and the same is held secured by bolts 176. Said motor as here disclosed has a drive shaft 178 and a sprocket 180 secured on said shaft. Passing over sprockets 170 and 180 is a link chain 182. Said motor will be connected to a source of electrical energy by a conduit 182. A switch 185 is mounted at the forward end of said member 10 where it is easily reached by the operator. A conduit 186 connects said switch with motor 175.

In the instant operation, applicant's device will be adapted to apply a different color on each of the two surfaces 53*a* and 53*b* respectively lying in different planes. The impression member 74*d* will be positioned to contact and make a colored impression on said surface 53*b*. Said impression roller 160 will be positioned to contact and make a colored impression on said surface 53*a*. Said impression member and said impression roller as portions respectively of said first and second printing elements above described are movable upwardly and downwardly by operation of cranks 64 and 65.

The operator will close switch 185 starting motor 175. Said motor by sprocket 180 and chain 182 will drive sprocket 170. Sprocket 170 by chain 168 will drive sprocket 165 and shaft 81'. Sprocket 113 on shaft 81' will drive sprocket 112, shaft 72'' and impression roller 160 secured to said shaft. Sprocket 165 will operate levers 120 and 121 which in turn will rotate inking roller 116. Said roller 160 by contact will rotate rollers 89 and 91. Said last two mentioned rollers by contact will rotate roller 100. Levers 122 and 123 will be oscillated by cams 127 mounted on said shaft 81'. Transfer roller 129 journaled between the upper ends of said levers 122 and 123 will be oscillated between said roller 116 and said roller 100 carrying ink from roller 116 to roller 100. Said roller will be moved from side to side by lever 131 in passing on said ink to rollers 89 and 91. Thus said ink is applied evenly to said last two mentioned rollers. Said last two mentioned rollers pass said ink by contact onto roller 83 and thence to the impression roller 160.

Said first printing element will operate in the same manner as said second printing element above described and will be actuated by chain 142 passing over sprockets 140' and 140. As said printing elements are positioned upwardly and downwardly in different vertical positions, said chains 168 and 142 will be kept tightened by the idlers provided and above described.

When said first and second printing elements have operated sufficiently to have ink supplied to platen 74*d* and impression roller 160, the operator will then place said member 53 on member 50 carried by chains 45 and 46. Said jig 51 on member 50 will be adapted to hold said member 53 in position. Said chains will move said member 53 toward said platen 74*d* and in passing thereunder said platen will make a colored impression on said surface 53*b*. Said member 53 will be moved onwardly towards said impression roller 160 and in passing thereunder said roller will make a colored impression on said surface 53*a*. As said work object is carried to the end of member 14, it will fall off of said jig 51 and into an appropriate receptacle. Said chains 45 and 46 may be tightened or loosened as desired by operation of adjusting screws 35.

Thus it is seen that I have provided a simple and efficient device for applying different colors to surfaces in different planes of a piece of work in a continuous operation with only one handling required of said work. Said device may be adapted to make impressions in a piece of work by applying pressure to the surfaces of said work in the same manner as it may apply color or it may perform a combination of such operations. Applicant's device has been thoroughly tested in practice and has been very successful. It is now being commercially produced.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which, generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A machine for making impressions on a piece of work having in combination, a supporting frame having an endless belt moving thereabout for carrying said work, a printing mechanism comprising a pair of angle members upstanding from said frame and spaced transversely thereof having sides facing forwardly and respectively having forwardly extending right-angled lug portions at their upper ends, a second pair of angle members respectively overlying a substantial portion of said first angle members and being slidably secured thereto, said last mentioned angle members having upper end portions bent forwardly at right angles in alinement with said lugs,

crank members respectively rotatingly secured to said lugs and threaded to said forwardly bent portions alined therewith to provide upward and downward movement for said second angle members, a printing member positioned between a lower portion of said second pair of angle members, said printing member comprising a shaft journaled between said second angle members, a supporting member secured to said shaft, and an impression member adjustably secured to said supporting member, means carried by said second angle members for inking said impression member, and means associated with said frame for driving said belt and rotating said printing member.

2. The structure set forth in claim 1, said supporting member comprising a collar slidably secured to said shaft, said collar having an elongated hub extending outwardly therefrom, a stem telescopically secured in said hub, and an elongated impression member of narrow width secured to and carried by said stem.

3. The structure set forth in claim 2, said impression member being convexly curved in transverse section.

4. The structure set forth in claim 1, and a second vertically adjustable printing mechanism spaced longitudinally from said first mentioned printing mechanism whereby the printing members of the first and second printing mechanisms have vertical adjustment to print on surfaces in various planes.

5. A machine for making impressions on a piece of work having in combination, a supporting frame having an endless belt movable thereabout for carrying said work, a printing mechanism comprising a pair of angle members upstanding from said frame and spaced transversely thereof having sides facing forwardly, said members respectively having forwardly extending right-angled lugs at their upper ends, a second pair of angle members respectively overlying and being slidably secured to said first mentioned angle members and extending over a substantial portion thereof and having upper end portions bent forwardly at right angles in vertical alinement with said lugs, crank members respectively connecting said lugs with said last mentioned upper end portions for adjustably moving said second angle members relative to said first angle members, a printing member journaled between and carried by said second mentioned angle members, said printing member being positioned adjacent said endless belt, a roller secured to a shaft journaled between said second mentioned angle members positioned to contact said printing member, said shaft extending outwardly of said second angle members at each side thereof, a pair of horizontally spaced rollers journaled between said second angle members respectively positioned to contact said last mentioned roller, a second roller journaled between said second mentioned angle members positioned to contact said spaced rollers, said second roller having a shaft extending outwardly of said angle members at one side thereof, a lever fulcrumed to one of said angle members at substantially its midpoint having its upper end pivoted to the outer end of said second shaft, a rotary cam mounted at one end of said first shaft, the lower end of said lever being engaged by and oscillated by said cam to move said second roller from side to side as said cam is rotated, means mounted on said second mentioned angle members for holding a supply of ink, an inking roller, and means for oscillating said inking roller from said ink supply to said second roller whereby said second roller transfers to and distributes said ink evenly on said spaced rollers.

6. The structure set forth in claim 5, said last mentioned means comprising a pair of levers of some length spaced transversely of said frame fulcrumed at substantially their midpoint to a supporting member secured to said second angle members, a pair of coiled tension springs respectively having one end secured to the lower ends of said levers and having their other ends respectively secured to said second angle members, a pair of eccentric cams mounted on said first mentioned shaft adjacent the ends of said first roller adapted to urge the lower portions of said levers in one direction against the tension of said springs to have said inking roller contact said ink supply and said springs urge said levers in the opposite direction to transfer said ink to said second roller.

References Cited in the file of this patent

UNITED STATES PATENTS

1,012,156	Ranz	Dec. 19, 1911
1,721,922	Roe	July 23, 1929
2,185,088	Kronquest	Dec. 26, 1939
2,348,537	Greenwood	May 9, 1944