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ROTARY WEB ANILINE PRESS

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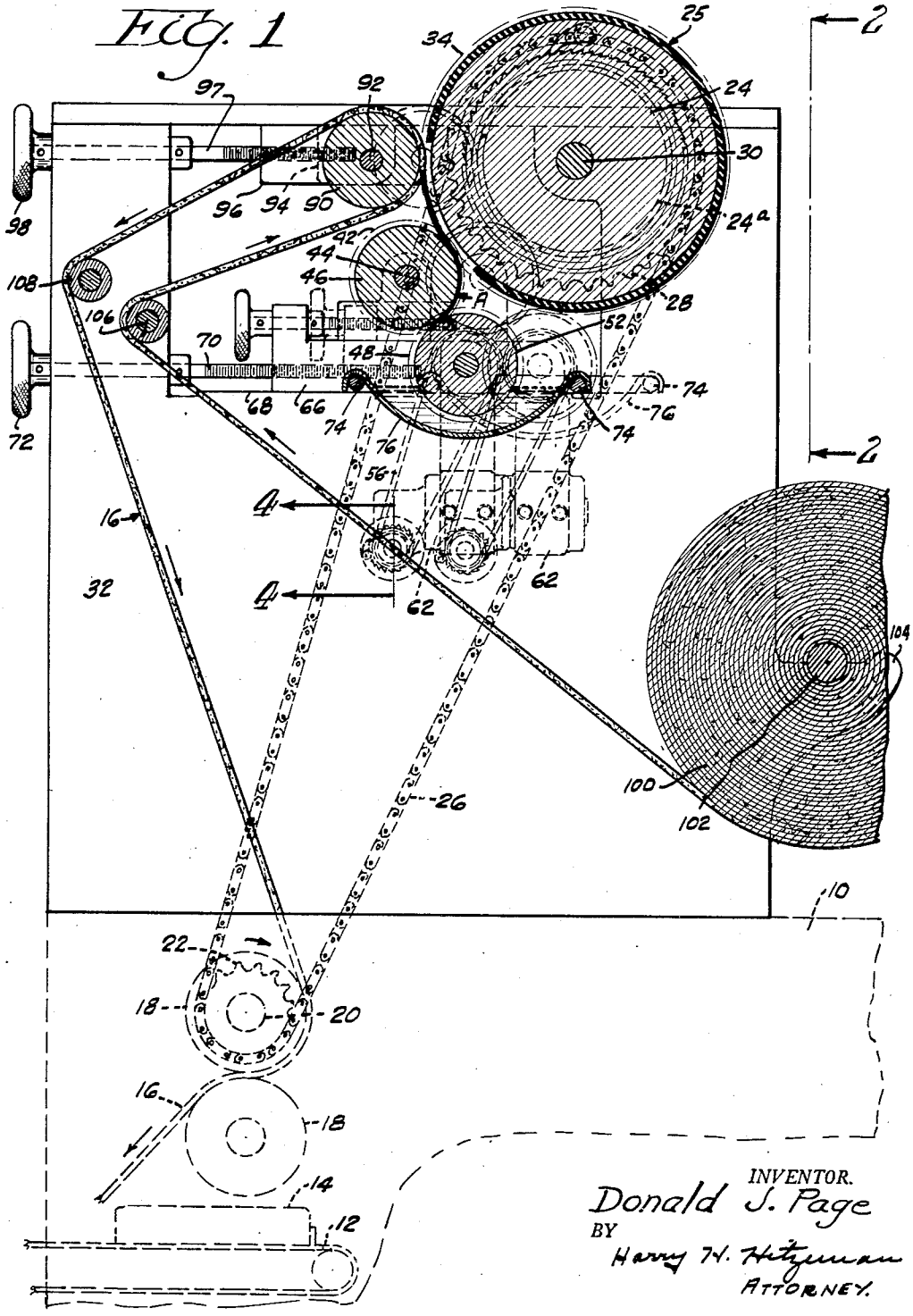
Fig. 1



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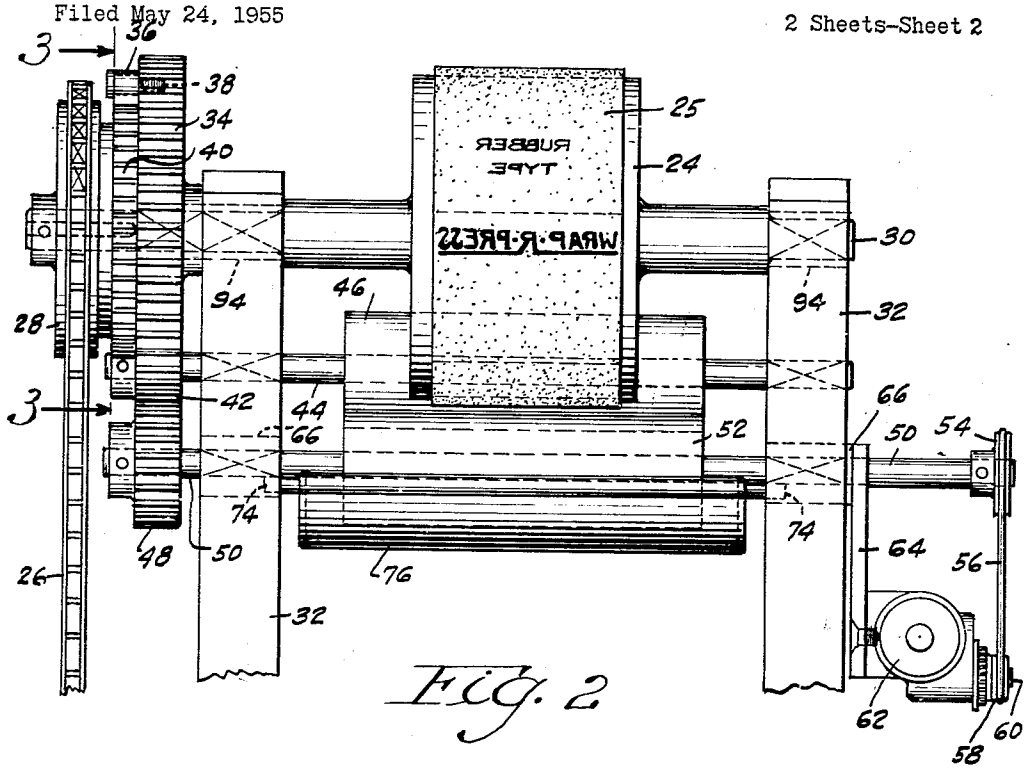

Fig. 2

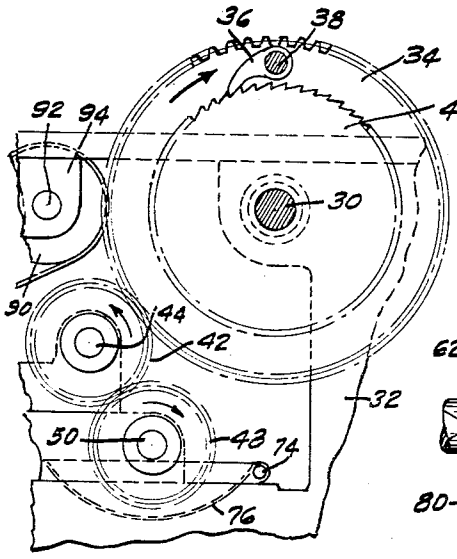

Fig. 3

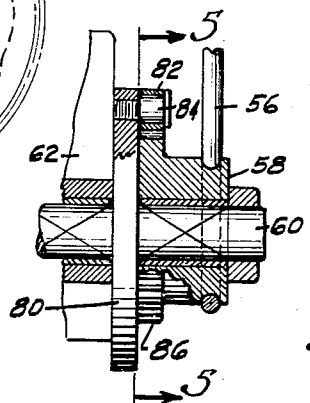

Fig. 4

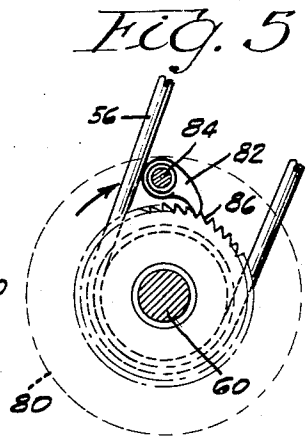

Fig. 5

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ROTARY WEB ANILINE PRESS

Donald J. Page, Green Bay, Wis.

Application May 24, 1955, Serial No. 510,737

5 Claims. (Cl. 101—219)

My invention relates to improvements in printing presses.

My invention relates more particularly to improvements in the process of aniline printing and apparatus for carrying out said process.

Aniline printing is done with molded rubber plates which are adhered to the plate or type roll. Because of the watery consistency of aniline inks used for this type of printing and their high volatility which causes fast drying, the presses are usually run at an extremely high speed. In addition, in the usual arrangement in presses of this type, ink rolls transfer the ink to a plate roll which engages the tympan roll, the paper web to be printed upon being fed between the plate roll and tympan roll. In this operation the ink is exposed on two rolls for quite a distance and travels through approximately 360° on the surface of one ink roll and the plate roll before finally being transferred to the paper web. Thus, it is obvious that with presses of this type high speed as well as continuous operation is required.

There are many needs for presses of this type with host machines which operate only at intermittent intervals. Wrapping machines, for example, operate only when products arrive at the wrapping station. In these machines at present slow drying oil ink printers are used for "spot-printing" prices, dates, codes, etc. on the preprinted wrapping material as it passes through the wrapping machine. These inks do not print sharply, have a tendency to smudge and are otherwise not satisfactory. Previous types of aniline presses could not be used in such applications because the ink would dry on the rolls at the slightest stoppage of the machine, and would thus omit printing for a short lapse of time.

The principal object of the present invention is to provide an improved construction of aniline press capable of use at slow speeds and at intermittent times.

A further object of the invention is to provide an improved aniline press which by its novel arrangement of ink pan, ink rolls, plate roll and tympan roll, carries ink through an arc of less than 135° turning of the axis of the ink rolls before transferring to the paper web.

A further object of the invention is to provide an improved aniline press construction wherein the ink rolls are kept wet continuously regardless of whether printing is done or not.

A further object of the invention is to provide in an aniline press means for continuously operating the ink rolls of the same, so that even with intermittent operation of the press the ink on the rolls will at all times be "wet" and good printing results will be obtained at slow speed or intermittent printing runs.

Other objects and advantages will be more apparent from the following description wherein reference is had to the accompanying drawings, upon which:

Fig. 1 is a longitudinal sectional view through an aniline press embodying the features of my invention, positioned upon a host machine such as a package wrapping machine;

Fig. 2 is a fragmentary end view from the right end of the press, taken generally on the line 2—2 as indicated on Fig. 1;

Fig. 3 is a fragmentary sectional view showing the gearing, ratchet and pawl of the plate roll, and is taken generally on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional view through the shaft of the motor and associated parts which are carried by the ink roll frame, and is taken generally on the line 4—4 of Fig. 1; and

Fig. 5 is a vertical sectional view thereof taken on the line 5—5 of Fig. 4.

In the embodiment of the invention which I have chosen to illustrate and describe the same, I have shown the aniline press mounted upon a support portion 10 of a host machine such as the usual type of wrapping machine that is used in many places for wrapping packages in cellophane, paper, or other material which normally has printing of various types on the same. The machine as shown may have a conveyor 12 for carrying a product 14 into a position to be wrapped in the path of a paper web 16 that is moved into position by means of a pair of feed rolls 18 which are driven by the wrapping machine mechanism.

The shaft 20 of one of the rolls 18 may carry a drive sprocket 22 for driving the plate roll 24 of the press in register with the operation of the wrapping machine by means of a chain 26 that is geared to the sprocket 28 mounted on the shaft 30 of the plate roll 24. The shaft 30 may be journaled in suitable bearings in the vertical side support members 32 of the press. The shaft 30 may extend beyond the side support 32 to the left (Fig. 2) and carry a gear 34. A pawl 36 is fastened to the side of the gear 34 by a suitable bolt member 38. The sprocket wheel 28 previously mentioned carries a ratchet wheel 40 upon its face, the ratchet wheel 40 being so located that it may be engaged by the pawl 36, as will be presently described.

The gear 34 is adapted to mesh with a gear 42 which is mounted on the shaft 44 of the upper ink roller 46. This gear in turn meshes with a gear 48 that is mounted on the shaft 50 of the partially immersed ink roll 52. The shaft 50 may extend to the right of the side support 32 and carry a pulley 54 that has a belt 56 trained about the same and a similar pulley 58 mounted on the drive shaft 60 of a motor 62. The motor 62 is carried on the outside of the side support 32 on bracket 64 which depends from an ink roll frame 66. One of the frames 66 is mounted on a horizontal track 68 in each of the side supports 32, the same being moved back and forth by means of a threaded rod 70 and hand wheel 72 in the usual manner.

The ink roll frames 66 are connected by a pair of horizontal cross-rods 74 which support the ink pan or fountain 76 therebetween. The motor 62 has a disc 80 fastened to its drive shaft 60, the disc having a pawl 82 fastened to the side thereof by means of a bolt member 84. The pawl 82 engages a ratchet wheel 86 which is formed integral with the pulley 58.

With this construction, when the motor 62 is operating, the pawl 82 will engage the teeth of the ratchet wheel 86 to drive the same, and through the belt 56 and pulley 54, the ink rolls 46 and 52 will be rotated, and a continuous supply of ink will be applied to the surface of these rolls whether any printing is being done or not.

The tympan roll 90 may be mounted up a shaft 92 which is carried in suitable brackets 94 in the horizontal guideways 96 in the side supports 32. Horizontal reciprocal movement of the same is effected by means of the threaded rod members 96 mounted in the side frames 32 and provided with the usual hand wheel 98.

The roll of paper webbing 100 may be mounted upon

a suitable shaft 102 that is supported in brackets 104 on the vertical side edges of the supports 32. The web of paper to be printed upon may be trained over a suitable idler 106, the tympan roll 90, a second idler roll 108, and then down through the pulling rolls 18 of the host machine 10.

When the host machine is operating and products are being carried forward on the conveyor 12 to be wrapped, the sprocket 22 will drive the press rolls by means of the chain 26 and sprocket 28 on the plate roll 24. The rubber printing platen 25 is mounted upon this roll. By means of the gearing through the train of gears 34, 42 and 48, the ink rolls will be driven and ink will be supplied to the surface of the rubber platen 25 so that the printing thereon will be deposited on the surface of the paper web as it is being drawn around the tympan roll by the puller rolls 18 of the machine 10.

It will be noted that the heavy line marked A indicates the ink film which is being carried to the surface of the paper web, and it can be seen from an examination of Fig. 1 that from the time the ink is picked up by the roll 46 to the time that it is deposited on the surface of the paper web, it travels only a comparatively short distance and through an arc of less than 135°. The ink rolls 46 and 52 are preferably about 2¾ inches in diameter, so it can readily be seen that the distance of travel of the ink from the fountain to the plate roll is very short. It will further be noted that by this arrangement of the ink rolls, plate roll and tympan roll, the inking elements are confined into a small space and the ink moves only through a limited distance, so that in effect the operation takes place in a saturated atmosphere, thereby preventing to a large extent any evaporation such as would occur when it is traveling over a considerable distance as in other aniline presses.

When the host machine comes to a stop, as when one shipment of the product has been wrapped and printing is interrupted, the motor 62 which is continuously operating at a speed slightly less than the speed of the host machine through the belt 56 and pulley 54 drives the lower ink roll 52. This in turn drives the upper ink roll 46 and plate roll gear 34 by means of the train of gears 48, 42 and 34. Since the chain 26 and sprocket 28 are at a standstill and the ratchet wheel 40 is also at a standstill, the pawl 36 will continue to ride over the teeth of the ratchet. In this manner during the intermittent stoppage of a host machine such as the wrapping machine mentioned, the ink rolls 46 and 52 will be continuously operating and the ink will be constantly wet upon the surfaces of the same.

When the host machine again takes over as when the next quantity of products are to be wrapped, the sprocket 24 will rotate the plate roll at a greater speed than it has been running. As a result, the ratchet 40 will engage the pawl 36 and in turn carry the gear 34 and its associated gears on the ink rollers at a rate of speed that is synchronized with the speed of the wrapping machine. When this takes place the accelerated speed will be transmitted through the shaft 50 of the ink roll 52 to the pulley 54, which in turn will drive the pulley 58 at a speed greater than that of the disc 80 and pawl 82 driven by the motor 62, thus completely changing the drive from the motor 62 to the host machine 10.

The mechanism above described thus accomplishes the main object of the invention, and that is to keep the ink rolls continuously wet. In addition the rubber plates or platens 25 which are used seldom, if ever, form a continuous blanket around the plate roll, so that, as shown on the drawings, the plate roll comes to rest each time with the "break" of the blanket occurring at the point where the ink transfer roll meets the plate roll so that the ink transfer roll can rotate freely with the plate roll at rest momentarily. Thus it can be seen that I have provided a construction of aniline printing press which may be applied to intermittently operating machines as well as to those that operate continuously.

Another important feature of the invention resides in the fact that due to the direct chaining or gearing to the host machine through the sprocket 22 and drive chain 26, perfect registry is obtained with the action of the wrapping machine, thus eliminating the necessity of the use of electric eye mechanisms and other means for advancing or retarding the wrapping material through advance or slowing-up of either the printing mechanism or the wrapping machinery.

In dotted lines in Fig. 1, I have shown the motor 62 and ink rolls 46 and 52 moved forward by means of the hand wheel 72 and ink roll frame 66. This is to accommodate a smaller plate roll 24*a* shown in dotted lines. The tympan roll 90 is of course also moved forward to engage the periphery of the rubber platen on the smaller plate roll 24*a* by means of the movable brackets 94.

From the above and foregoing description it can be seen that I have provided an improved aniline press which has the following advantages over the machines of the prior art. It carries the ink only through a short distance and only as much as 135° around the periphery of the rolls. In addition, due to the continuously operating motor 62, the ink rolls will be kept continuously wet. Further, by the synchronized drive with the host machine such as a wrapping machine, perfect register is obtained with the material to be wrapped.

While the press has been described and shown in connection with a wrapping machine, it is of course apparent that the advantages of the same can be applied wherever printing of this type is required, and it may be utilized with bag making machines, carton and case marking machines, and for every type of labeling or printing in connection with paper converting and fabricating machinery.

I contemplate that changes and modifications may be made in the exact details shown and I do not wish to be limited in any particular; rather what I desire to secure and protect by Letters Patent of the United States is:

1. A printing press for use with aniline ink comprising a pair of vertical side supports, a pair of ink roll frame members mounted therebetween, an ink fountain and a pair of ink rolls carried by said frame members, a pair of bearings mounted in said side supports above said ink rolls, a tympan roll carried thereby, a plate roll mounted in said side supports in peripheral engagement with and adapted to receive ink from said ink rolls, said ink rolls being mounted generally below and to one side of said plate roll, the tympan roll being mounted above said ink rolls and on one side of said plate roll, whereby the exposure of ink during a printing operation is confined between portions of the ink roll, plate roll and tympan roll, brackets for supporting a roll of paper on one edge of said side supports, idler rollers for the web of paper adjacent said tympan roll, said ink rolls and said plate roll having a train of gears on one side of the same, a sprocket on one of said ink rolls, a motor and a pulley and belt drive from said motor to one of said ink rolls, said plate roll also having a sprocket on one side of the same and an independent drive thereto for use during a printing operation, said drive being faster than said motor drive, and said plate roll gear being in free-wheel engagement therewith.

2. A printing press for use with aniline ink adapted to be mounted upon a packaging machine and driven in synchronism therewith, said packaging machine having a base, a pair of web pulling rolls, a sprocket on one end of said rolls, said press including a pair of vertical side supports mounted on said base, a pair of ink roll frame members mounted for horizontal reciprocation in said side supports, a continuously operating motor carried by one of said ink roll frame members, an ink fountain and a pair of ink rolls carried between said frame members, a pair of hori-

zontally adjustable bearings mounted in said side supports above said ink rolls, a tympan roll carried thereby, a plate roll mounted in bearings in said side supports, said ink rolls being mounted generally below and to one side of said plate roll, the tympan roll being mounted above said ink rolls and on one side of said plate roll, whereby the exposure of ink during a printing operation is confined between portions of the ink roll, plate roll and tympan roll, brackets for supporting a roll of paper on one edge of said side supports, idler rollers for a web of paper adjacent said tympan roll, each of said ink rolls and said plate roll having gears on one end of the same and a pulley and belt drive from said motor to one of said ink rolls, said web of paper threaded over said tympan roll and down through said web pulling rolls, said plate roll having a sprocket on its end and a chain drive thereto from said packaging machine sprocket.

3. An aniline printing press of the type having an ink fountain, a web, an intermittently operating plate roll, a tympan and continuously operating ink transfer rolls associated with said fountain, the disposition of the ink rolls being such that from the point of metering from the ink fountain to the point of application to the web, the ink is carried no more than 135° turning of the axis of the ink transfer rolls on the surfaces of the ink transfer rolls and the plate roll combined, the tympan roll being mounted in alignment with the plate roll and above the ink rolls and being of the same size as the ink rolls, the mounting of the rolls being such that the plate roll mounting is fixed and the tympan and ink rolls are adjustable to compensate for various size plate rolls, said press having drive means for continuous rotation of the ink transfer rolls only between printing operations to effect a continuous wet ink supply.

4. An aniline printing press of the type having an ink fountain, a web, an intermittently operating plate roll, a tympan and ink transfer rolls associated with said fountain, the disposition of the ink transfer rolls being such that from the point of metering from the ink fountain to

the point of application to the web, the ink is carried no more than 135° turning of the axis of the ink transfer rolls on the surfaces of the ink transfer rolls and the plate roll combined, the tympan roll being mounted in alignment with the plate roll and above the ink roll and being of the same size as the ink rolls, the mounting of the rolls being such that the plate roll mounting is fixed and the tympan and ink transfer rolls are independently adjustable to compensate for various size plate rolls, said press having drive means for continuous rotation of the ink transfer rolls only between printing operations to effect a continuous wet ink supply, said press also having independent drive means for use during a printing operation.

5. An aniline printing press of the type having an ink fountain, a web, an intermittently operating plate roll, a tympan and ink transfer rolls associated with said fountain, the disposition of the ink transfer rolls being such that from the point of metering from the ink fountain to the point of application to the web, the ink is carried no more than 135° turning of the axis of the ink transfer rolls on the surfaces of the ink transfer rolls and the plate roll combined, the tympan roll being mounted in alignment with the plate roll and above the ink roll and being of the same size as the ink rolls, said press having a continuous drive for the ink transfer rolls only, said drive including a motor, a drive shaft therefrom, a drive from said shaft to one of said ink rolls and a train of gears between said ink roll and the other ink roll.

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