

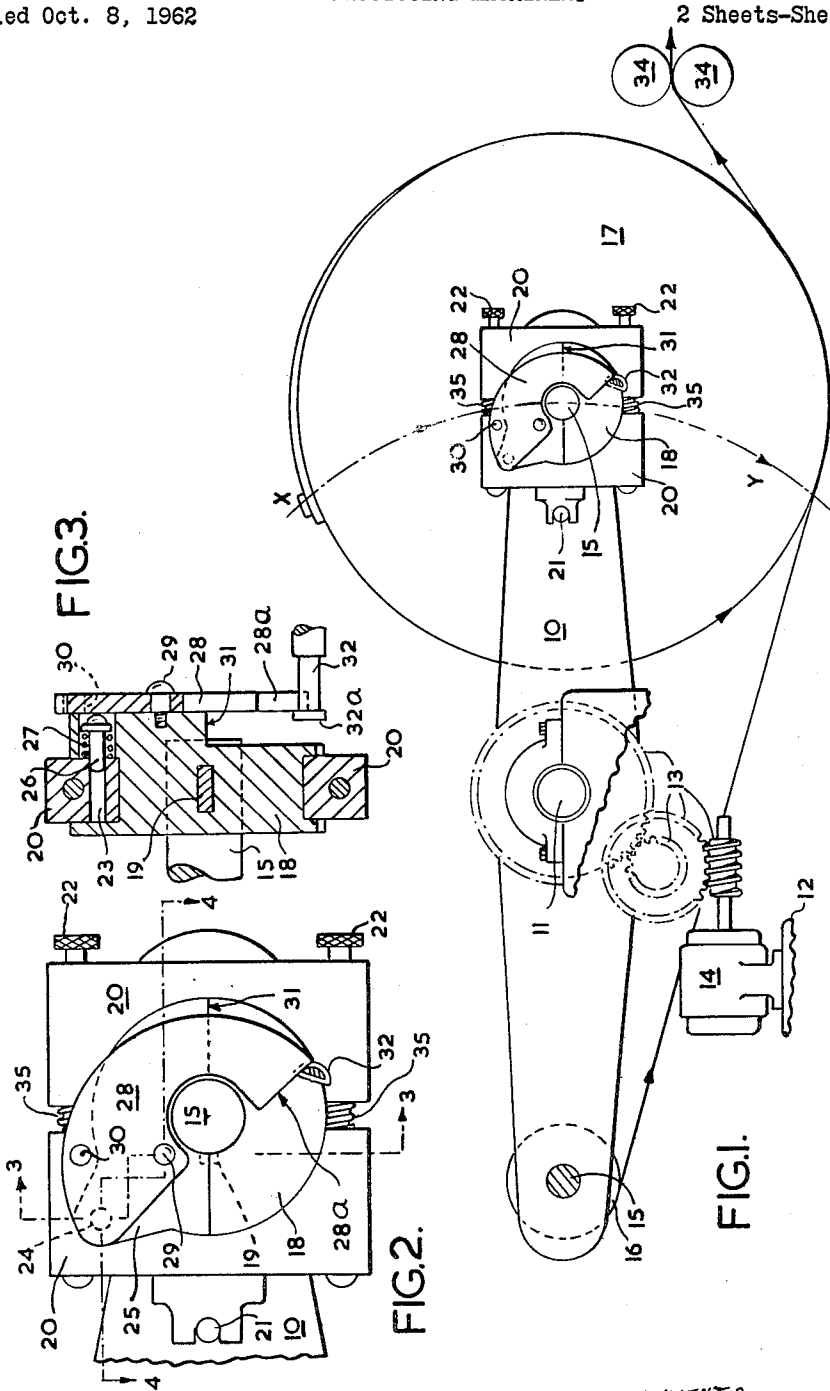
June 11, 1963

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EXHAUSTING WEB CONTINUOUSLY FEEDING  
PROCESSING MACHINERY

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Filed Oct. 8, 1962

2 Sheets-Sheet 1



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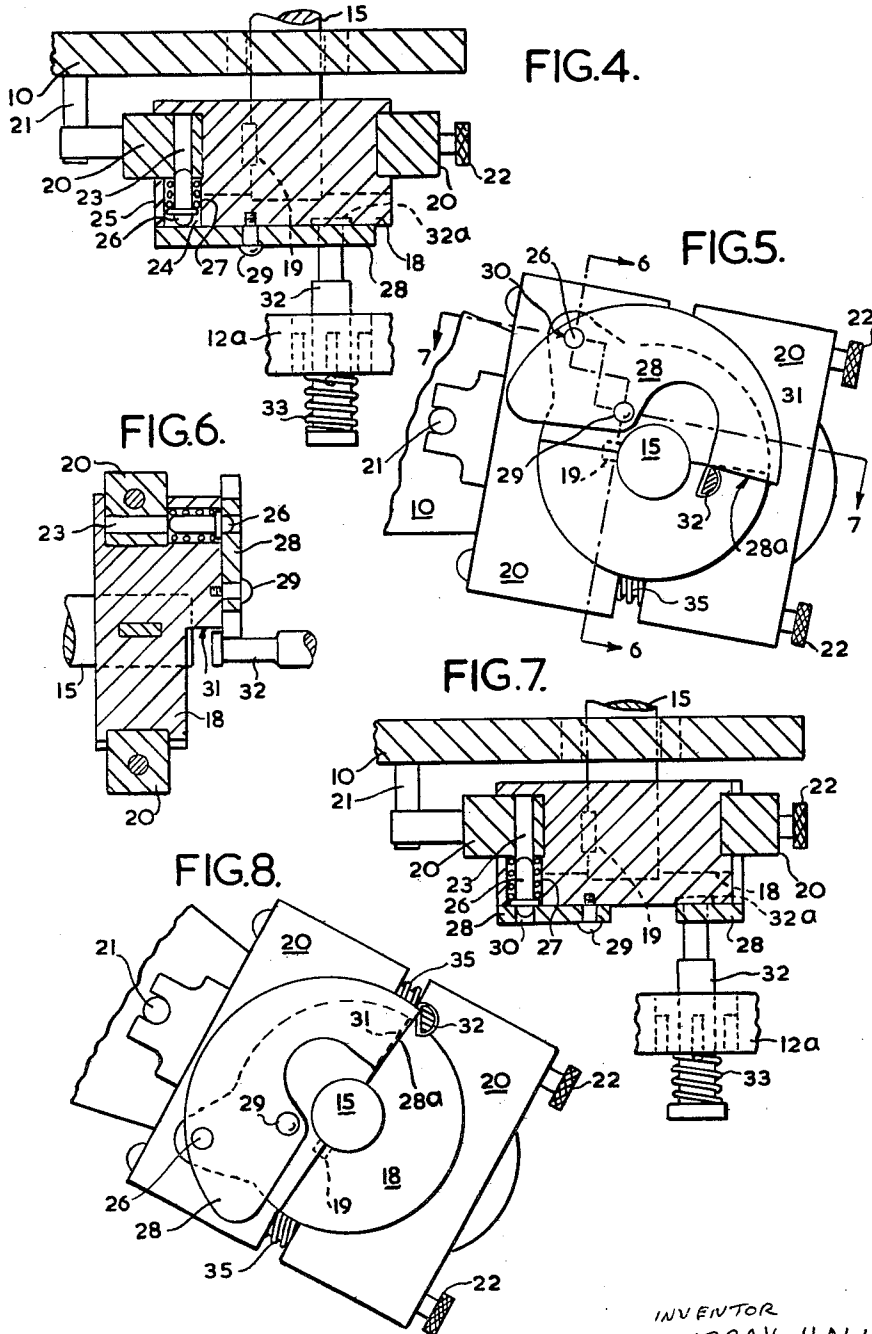
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**APPARATUS FOR JOINING A FRESH WEB TO AN EXHAUSTING WEB CONTINUOUSLY FEEDING PROCESSING MACHINERY**

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5 Claims. (Cl. 242—58.2)

This invention relates to apparatus for joining a fresh web to an exhausting web continuously feeding processing machinery. The invention has particular reference to the feeding of a paper web to printing machinery, but is also applicable for example for the feeding of cloth webs or metallic foils to rolling mills or the like.

This is a continuation-in-part of my application Serial No. 862,856 filed December 30, 1959 and now abandoned.

The invention has for its principal object to provide improved means for accelerating a roll of fresh web so that its peripheral speed can match the speed of delivery of web from an exhausting roll to the processing machinery whereby the connection of the webs is facilitated.

The invention consists of apparatus for joining a fresh web to an exhausting web that is being continuously fed to processing machinery or the like comprising a support, a turret pivotally mounted on said support, an exhausting web roll mounting shaft and a fresh web roll mounting shaft each rotatably mounted on the turret, means guiding the exhausting web toward said machinery in peripheral frictional contact with said fresh web roll, means releasably locking said fresh web roll against rotation on said turret, drive means for rotating the turret about its pivot on the support in a selected direction for interchanging the positions of said roll shafts relative to said machinery, means effective upon initial rotation of said turret in said direction for releasing said locking means, said initial rotation of said turret being accompanied by increased frictional contact between the exhausting web and said fresh web roll, and means operative automatically after said locking means is released and actuated by continued movement of the turret in said direction acting in combination with the increased frictional pressure between said exhausting web and the fresh roll for accelerating the rotation of the released fresh roll during less than one revolution of said fresh roll to a peripheral speed that is substantially equal to the speed of the exhausting web by virtue of the speed correction applied to the new roll by the exhausting web in peripheral frictional contact therewith during said acceleration.

Preferred means for carrying the invention into practice is described by way of example only, with reference to the accompanying drawings, wherein:

FIGURE 1 is a part sectional side elevation of a web unwinding stand according to the invention;

FIGURE 2 is a fragmentary side elevation on an enlarged scale of the right hand end of FIGURE 1;

FIGURES 3 and 4 are sections on lines 3—3 and 4—4 of FIGURE 2 respectively;

FIGURE 5 is a similar view to that of FIGURE 2, but showing the parts of the accelerating mechanism at the commencement of the angular acceleration of the roll;

FIGURES 6 and 7 are sections on lines 6—6 and 7—7 of FIGURE 5 respectively; and

FIGURE 8 is a side view similar to that of FIGURES 2 and 5 but showing the mechanism at the end of the acceleration of the roll.

In the illustrated embodiment of the invention there is provided a turret comprising a parallel pair of spaced arms 10 which are pivotally mounted intermediate their

2

ends on a shaft 11 supported on a fixed frame 12 and can be rotated relative to the frame through gearing 13 driven by an electric motor 14. The turret arms support between their ends a pair of rotatably mounted shafts 15 which are adapted for engagement with the tubular reels which carry the rolls 16 and 17 of paper web so that the reels and rolls are secured for rotation with the shafts 15. Each shaft 15 carries at one end a brake drum 18 which is keyed 19 to the shaft 15 and has peripheral frictional engagement with a pair of brake blocks 20 secured by the lug 21 to one arm of the turret. The brake blocks 20 are urged together against interposed springs 35 so as to engage the drum 20 with a desired pressure controlled by a pair of manually adjustable tie bolts 22 connecting the brake blocks 20 whereby the rotation of the roll feeding the processing machinery is resisted to afford the required tension in the web.

The brake drum 18 can be locked to the brake blocks 20 by the provision of an aperture 23 in one of the brake blocks and, at an equal radius with respect to the shaft 15, an aperture 24 in a flange 25 on the brake drum. The aperture 24 in the brake drum flange accommodates a plunger 26 which when the pair of apertures 23, 24 are in registry can be located also in the brake block apertures 23 thereby to lock the drum 18 and brake blocks 20 together. The plunger 26 is loaded by a spring 27 to bias the plunger 26 out of engagement with the brake block aperture 23 and is controlled by a catch plate 28 which is pivotally mounted at 29 on the end face of the brake drum so as to cover the said flange aperture 24 and is itself furnished with an aperture 30 which when registered with the drum and brake apertures 23, 24 permits the spring loaded movement of the plunger 26 to disengage the brake blocks 20 thereby to permit rotation of the brake drum 18 and shaft 15 against the frictional resistance of the brake blocks 20.

One end of the brake drum 18 is furnished with a radially extending shoulder face 31 providing an abutment at right angles to the end face of the brake drum and extending from the shaft 15 to the periphery of the brake drum.

The aforesaid abutment shoulder 31 co-operates with a stationary abutment member mounted on the cradle supporting frame 12. The stationary abutment member consists of a pin 32 mounted for axial movement in a bracket 12a rigid with the cradle supporting frame 12 with the longitudinal axis of the pin parallel with the shafts 15. Bracket 12a is only shown fragmentarily in FIGURES 4 and 7 and it may have any suitable rigid connection with the frame 12, such as a rigid extension of frame 12 to the right in FIGURE 1.

The pin 32 is biased by a spring 33 for axial movement to a position out of the arcuate path of movement of the abutment shoulder 31 with the cradle 10 and is furnished with a head 32a which can be latched behind an edge 28a of the catch plate 28 whereby the pin 32 is retained in an abutment shoulder engaging position until the pin has co-acted with the abutment shoulder 31 to effect the acceleration of the fresh web roll 17.

In operation the turret arms 10 are set in a generally horizontal position with the exhausting roll of web 16 disposed on the opposite side of the turret fulcrum 11 to that of the processing machinery which is consuming the exhausting web through the nip rolls 34, and a roll of fresh web 17 is mounted on and secured to the shaft 15 nearer the processing machinery. The fresh roll shaft 15 is rotated to bring the plunger 26 carried by the brake drum 18 into registry with the aperture 23 in the brake block 20, and the plunger 26 is depressed to engage the brake block 20 and is retained in this position by rotation of the catch plate 28 to cover the aperture 23. Thus the shaft 15 is effectively locked to the turret arm 10 with

the movable abutment shoulder 31 turned to the correct disposition for slidable engagement with the pin 32. The pin 32 is then moved against its spring loading 33 and the head 32a of the pin is engaged by the edge 28a of the catch plate 28, as seen in FIGURES 2, 3 and 4, so as to retain the pin head in position for subsequent co-action with the abutment shoulder 31. In this position the exhausting web 16 is traversed beneath and in peripheral contact with the roll of fresh web 17 so that the moving exhausting web tends to rotate roll 17, any rotation of the latter roll being prevented by the plunger 26.

An adhesive compound is applied at X to the periphery of the roll of fresh web 17 at given angular position in relation to the turret, and the outermost turn of web 17 is lightly secured to the adjacent turn also by adhesive. When it is desired to effect connection of the fresh web to the exhausting web the turret 10 is angularly displaced by its motor 14 so as to lower the fresh web roll 17 along the path Y. This downward movement of the fresh roll 17 results inherently in increased frictional pressure engagement of the exhausting web with the periphery of roll 17, thereby increasing correspondingly the tendency of the exhausting web to rotate roll 17. During the initial part of the downward movement of the fresh roll 17, prior to the engagement of the abutment shoulder 31 and relatively stationary pin 32, the catch plate 28 is rotated about the pivot 29 by its slidable engagement with the pin 32 until the aperture 30 therein registers with the plunger 26, as seen in FIGURES 5, 6 and 7, thereby allowing movement of the plunger 26 to free the roll shafts 15 and roll 17 from latched engagement with the brake blocks 20 for rotation with respect to the cradle 10. This frees the roll 17 for rotation under the peripherally exerted frictional pull of the exhausting web, and therefore roll 17 slowly starts to rotate counterclockwise. The downward movement of the turret 10 is continued and when the abutment shoulder 31 engages with the relatively stationary pin head 32a it will be seen that the continuing descent of the fresh roll 17 will be accompanied by angular movement of the abutment shoulder 31 over the pin head 32a whereby rotation of the fresh roll 17 is angularly accelerated until the abutment shoulder has cleared the pin as seen in FIGURE 8. The combined efforts of the strong frictional pull on the periphery of roll 17 due to the increased frictional engagement of the roll 17 and the exhausting web at the time the roll is unlocked for rotation and the co-action of the abutment shoulder 31 and pin 32 will result in acceleration of the speed of rotation of the roll 17. Thus the fresh web roll 17 will be accelerated to a definite speed dependent on the speed of descent of the roll with the turret arms 10, the formation of the abutment shoulder 31 and the period of its engagement with the pin 32, so that by adjustment of the initial position of the pin 32 relative to the abutment shoulder 31 the fresh roll 17 can be given the necessary acceleration for matching the peripheral speed of the fresh web roll 17 with the speed of delivery of the exhausting web 16 to the processing machinery, which matching is assisted by the frictional engagement of the fresh web with the exhausting web, whereby the adhesive area X of the fresh web meets the exhausting web and the two webs adhere together at substantially synchronous speeds, the outermost turn of the new web being torn away from the adjacent turn to permit continuing feed from the fresh roll 17. The fresh web having been joined to the exhausting web in

the aforesaid manner, the exhausting web is severed from its roll by a knife in known manner so that the fresh web only is delivered to the processing machinery.

I claim:

1. Apparatus for joining a fresh web to an exhausting web that is being continuously fed to processing machinery or the like comprising a support, a turret pivotally mounted on said support, an exhausting web roll mounting shaft and a fresh web roll mounting shaft each rotatably mounted on the turret, means guiding the exhausting web toward said machinery in peripheral frictional contact with said fresh web roll, means releasably locking said fresh web roll against rotation on said turret, drive means for rotating the turret about its pivot on the support in a selected direction for interchanging the positions of said roll shafts relative to said machinery, means made effective by initial rotation of said turret in said direction for releasing said locking means, said initial rotation of said turret being accompanied by increased frictional contact between the exhausting web and said fresh web roll, and means operative automatically after said locking means is released and actuated by continued movement of the turret in said direction acting in combination with the increased frictional pressure between said exhausting web and the fresh roll for accelerating the rotation of the released fresh roll during less than one revolution of said fresh roll to a peripheral speed that is substantially equal to the speed of the exhausting web by virtue of the speed correction applied to the new roll by the exhausting web in peripheral frictional contact therewith during said acceleration.

2. The apparatus defined in claim 1, wherein said means for accelerating the fresh roll comprises cooperating relatively movable operatively engageable abutments, one carried by the support and the other rotatable with the fresh web roll.

3. In the apparatus defined in claim 1, said means for accelerating the fresh web roll comprising an abutment shoulder rotatable with said fresh web roll and a relatively stationary abutment member mounted on the support to extend into the path of said shoulder when the turret is rotated in said direction.

4. In the apparatus defined in claim 3, said locking means comprising a movable member rotatable with said fresh roll and adapted to engage said stationary abutment member to be moved thereby to fresh web roll unlocking position upon initial rotation of said turret in said direction.

5. In the apparatus defined in claim 4, said abutment shoulder rotatable with said fresh web roll engaging said relatively stationary abutment member after said movable locking member has been moved to unlocking position.

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