

[54] **SLITTING AND REWINDING MACHINE**

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[58] **Field of Search**..... 242/56.2, 56.3, 56.4, 242/56.5, 56.6, 56.7, 56.9, 56 A, 55, 42, 80, 58

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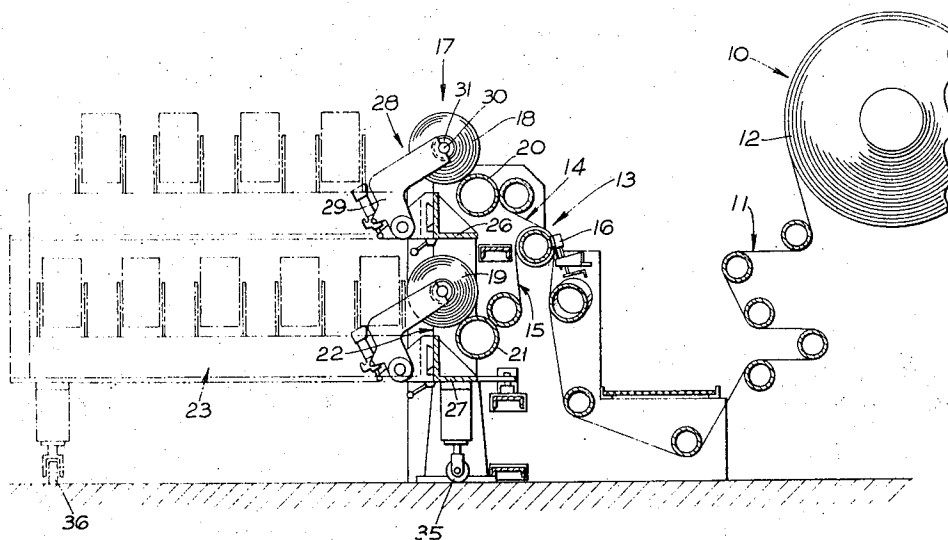
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[57]

ABSTRACT

A slitting and rewinding machine, wherein a relatively wide web of material, such as paper or plastics film, is slit into a plurality of narrower webs which are then rewound into individual rolls, comprises, at a rewind station thereof, at least one pair of roll support assemblies carrying a plurality of individual roll carriers, the assemblies being pivotable and arrangeable in a first configuration wherein one assembly is in a rewind position and the other assembly is in an unload position and a second configuration wherein the positions of the assemblies are reversed, enabling a second run of the machine to take place whilst full individual rolls are removed from the inoperative assembly, so reducing machine downtime and increasing productivity.

2 Claims, 2 Drawing Figures



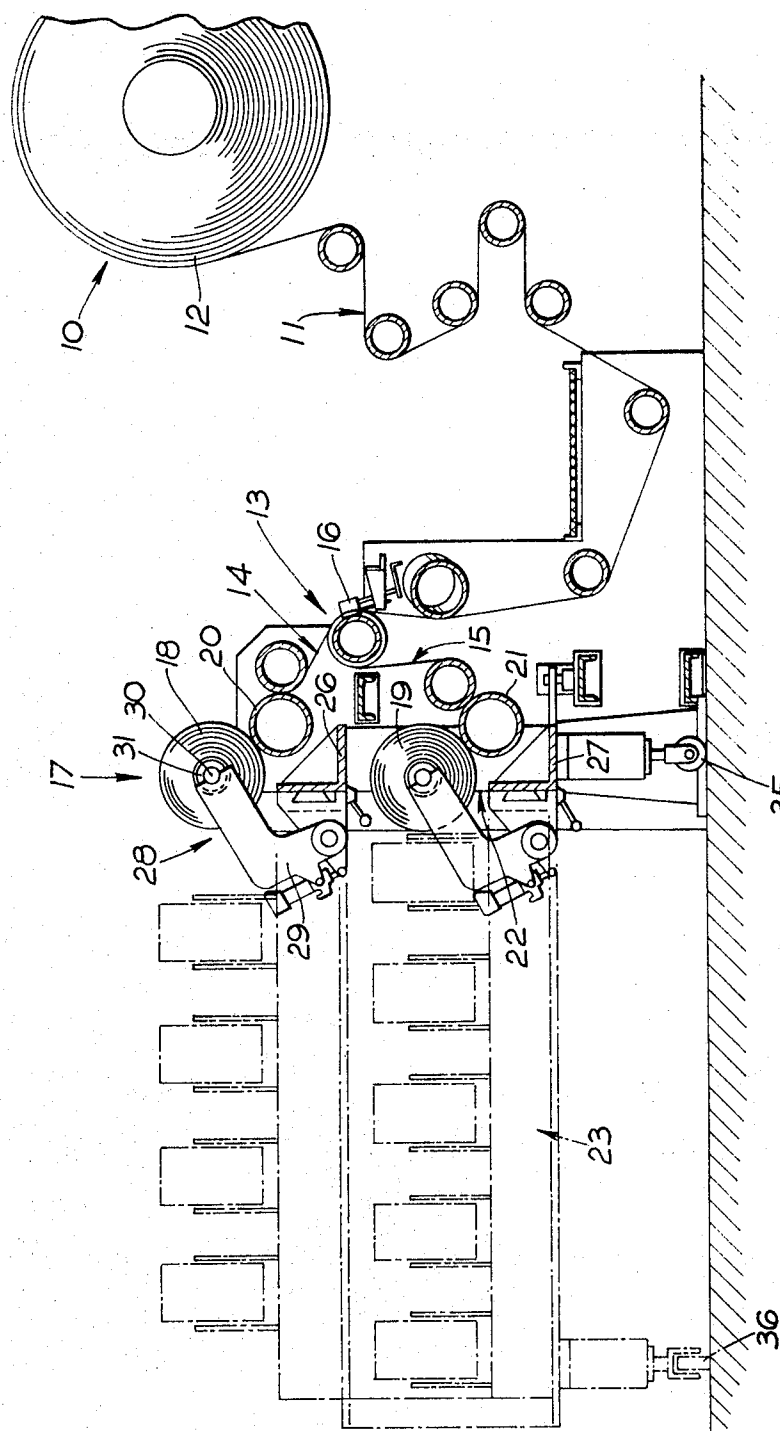


Fig. 1.

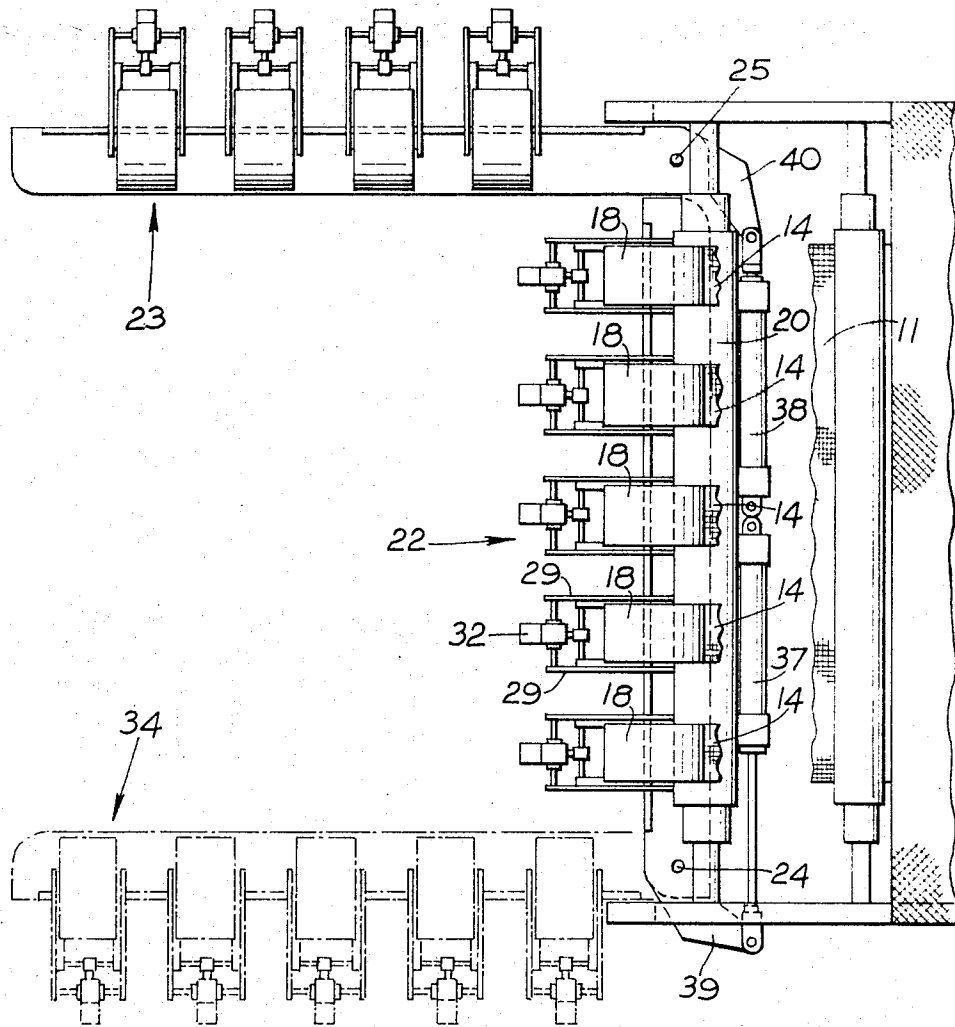


Fig. 2.

SLITTING AND REWINDING MACHINE

FIELD OF THE INVENTION

This invention relates to a slitting and rewinding machine in which a relatively wide web of material such as paper or plastics film can be drawn from a relatively wide unwind roll, slit into a plurality of relatively narrow webs, and the narrow webs rewound into individual relatively narrow rolls at a rewind station of the machine.

DISCUSSION OF THE PRIOR ART

When such a machine has finished its run, it has heretofore been necessary to stop the machine and allow it to lie idle whilst the individual narrow rolls are removed from a roll support assembly of the machine and the machine is prepared for another run. It is customary nowadays for a large number of individual narrow rolls to be rewound on such a machine and it will be appreciated that the time spent in removing the narrow rolls from the machine can be considerable and a severe disadvantage.

OBJECT OF THE INVENTION

It is an object of the present invention to provide in a slitting and rewinding machine means whereby the above mentioned disadvantage is minimized and which can have a higher productivity and lower downtime than known machines.

Accordingly the invention provides a slitting and rewinding machine having, at a rewind station thereof, at least one pair of roll support assemblies each comprising an elongate support and a plurality of individual roll carriers mounted on the support, each pair of assemblies being mounted for pivotal movement about an axis at or adjacent respective one ends thereof so that the assemblies can be arranged in a first configuration wherein one of the assemblies is in a rewind position and the other of the assemblies is in an unload position, and a second configuration wherein the other of the assemblies is in the rewind position and the said one of the assemblies is in the unload position.

Advantageously each pair of assemblies are mounted for pivotal movement about vertical axes disposed symmetrically about a centre line of the machine and spaced apart by a distance slightly greater than the length of the supports. In the last mentioned embodiment, that support which is in the rewind position extends across the width of the machine generally in the plane defined by the two axes and that support which is in the unload position is disposed so as to extend generally at right angles to the support which is in the rewind position and generally parallel to the centre line of the machine.

The invention is applicable to slitting and rewinding machines employing surface winding, i.e., where a web is wound onto a roll by friction at contact with, say, a rewind drum, centre winding, i.e., where a web is wound onto a roll by a driven central axle or spindle of the roll, or machines employing a combination of surface and centre winding.

DESCRIPTION OF A PREFERRED EMBODIMENT

The invention will be described further, by way of example, with reference to the accompanying drawings, wherein:

FIG. 1 is a side view, partly in section, of a preferred embodiment of slitting and rewinding machine conforming to the invention; and

FIG. 2 is a fragmentary plan view of the machine of FIG. 1.

A preferred embodiment of slitting and rewinding machine conforming to the invention comprises an unwind station 10, which is not relevant to the present invention and is not fully shown, whence a relatively wide web 11 of material is drawn from a relatively wide roll 12, a slitting station 13, where the wide web 11 is slit into a number of narrow webs 14, 15 in conventional manner, e.g., by razor-blade type slitters 16 or by rotary scissor-type slitters, and a rewind station 17 where the narrow webs 14, 15 are rewound into individual rolls 18, 19. After the slitting station the narrow webs are divided into two sets 14, 15 and led to the rewind station 17 which comprises two rewind drums 20, 21 extending across the machine and spaced one above the other. The webs 14 and 15 are led to drums 20, 21 respectively.

The rewind station 17 comprises a pair of roll support assemblies 22, 23 which are pivotable about vertical axes 24, 25 respectively spaced at opposite sides of the machine. The assemblies 22, 23 are essentially identical and only one thereof will be described in detail.

The roll support assembly 22 comprises two elongate supports in the form of horizontally disposed beams 26, 27 each of which carries a plurality of individual roll carriers 28. Each roll carrier 28 comprises a pair of generally L-shaped flat plates 29 spaced apart by a distance corresponding to the width of the narrow webs 14 and is pivotally attached by a bracket to its respective beam 26, 27 at its lower end. The upper ends of the plates 29 mount a spindle 30 carrying a core 31 onto which a narrow roll 18 can be wound.

The assembly 22 is mounted (as will be later described) so that when it is in its rewind position its beams 26, 27 are disposed below the level of the respective rewind drums 20, 21 and each roll carrier 28 is influenced by a pneumatic or hydraulic ram 32 so as to press its respective roll 18 against the adjacent rewind drum 20 or 21 so that a narrow web 14 or 15 passing around a part of the periphery of the respective rewind drum 20, 21 can be rewound thereonto by surface winding. Each roll carrier 28 is provided with a hydraulic, electric or pneumatic motor (not shown) which drives the spindle 30. The machine thus employs a combination of surface and centre winding.

Control apparatus (not shown) for each roll carrier 28 is mounted on the respective beam below each roll carrier 28 and connections between the control apparatus and sources of compressed air and/or hydraulic fluid and/or electric current, are made by means of flexible interconnections (not shown).

The assemblies 22, 23 are mounted for pivotal movement about their respective vertical axes 24, 25 at or adjacent respective one ends thereof and disposed adjacent respective ends of the rewind drums 20, 21. The axes 24, 25 are spaced apart by a distance greater than the length of the beams 26, 27 so that the assemblies 22, 23 can be arranged in a first configuration (illustrated in full lines in FIG. 2) wherein the assembly 22 is in a rewind position, i.e., its beams 26, 27 are disposed substantially parallel to the rewind drums 20, 21 and individual rolls 18 can be wound thereon and, during winding, can be pressed into contact with the drums

20, 21 by the pneumatic rams, and the other assembly 23 is in an unload position, i.e., is disposed substantially at right angles to the assembly 22; and a second configuration (illustrated in dotted lines in FIG. 2) wherein the assembly 23 is in the rewind position and the assembly 22 is in the unload position indicated by the reference numeral 34. Movement of the assemblies 22, 23 about the axes 24, 25 is effected by means of hydraulic or pneumatic rams 37, 38 acting on respective bent round lever portions 39, 40 integral with the assemblies 22, 23.

The lower extremities of the assemblies 22, 23 are provided with rollers 35, 36 for supporting the weight of the assemblies during movement thereof. Tracks (not shown) can be provided on a floor adjacent the machine or on a part of a frame or base of the machine for permitting easy movement of the rollers 35, 36. Locking devices can, of course, be provided for locking each assembly in its rewind position.

The mode of operation of the assemblies 22, 23 will now be described.

At the start of a run a relatively wide web 11 of material, e.g., paper or plastics film, is fed from the unwind station 10 to a plurality of slitters 16 at slitting station 13. At the slitters 16 the wide web 11 is slit into a plurality of narrow webs of desired width which are divided into two sets 14 and 15 and led to the surfaces of the respective rewind drums 20, 21 and attached to the cores 31 carried by the spindles 30 of the roller carriers 18 of the assembly 22 which is in the rewind position. The cores 31 are short hollow cylinders, e.g., of cardboard or plastics material, and the narrow webs are attached thereto.

The machine is now run until the individual narrow rolls 18 have built up on cores 31 and reached a desired diameter or until the unwind drum 10 is empty. The machine is now stopped, the individual webs 14, 15 are severed and the assembly 22 is pivoted about its axis 24 by means of the ram 37 to the unload position. The assembly 23 is now swung about its axis 25 from the unload to the rewind position by means of ram 38 and a fresh run commenced. The full rolls on the assembly 22 can now be unloaded while the fresh run is in progress and removed, conveniently onto a conveyor extending parallel to the machine and perhaps serving one or more machines. Empty cores can now be reloaded into this assembly.

When the said fresh run is completed the configuration of the assemblies is again changed and a further run commenced. It will be appreciated that the machine of the invention does not have to stand idle whilst filled individual rolls 18 are removed therefrom and new cores 31 inserted and thus enables greater productivity to be achieved.

The invention is not limited to the precise details of the above described embodiment and variations may be made thereto within the scope of the invention. For example, the invention is not limited to machines employing both surface and centre winding and can be applied to machines employing either one of these alone.

The assemblies need not be pivotable about vertical axes and can be pivoted about any convenient, axes at or adjacent respective ends thereof.

The assemblies need not be limited to pivotal move-

ment through 90° and could, if so desired, be pivotable through 180° or any other practical angle.

In a machine employing a single rewind drum two pairs of assemblies can be provided on each side thereof the roll carriers of each pair bearing on a respective side of the drum. Each assembly in this case will comprise a single beam supporting a single row of roll-carriers. After slitting the two sets of narrow webs 14, 15 will be led one to each assembly that is in the rewind position. When rolls 18 have been built up these two assemblies will be swung away from the rewind drum and the two idle assemblies swung into their places.

I claim:

1. A rewinding section of a slitting machine for accommodating to the slitting of a relatively wide web of material into a plurality of narrower webs windable into individual rolls comprising:

a pair of roll support assemblies disposed adjacent the slitting machine and each including an elongated support and a plurality of individual roll carriers mounted on the support,

the assemblies each being pivotable about an axis adjacent one end of the slitting machine and arrangeable between a first configuration wherein one assembly is extendable across the machine in a rewinding position for the winding of the webs onto the cores thereof and the other assembly is in an unload position and a second configuration wherein the positions of the assemblies are reversed,

a pair of rewind drums spaced one above the other with the pair of roll support assemblies being disposed on one side thereof, each roll support assembly comprising a pair of parallel supports each carrying a plurality of roll carriers, the roll carriers of one support being capable of contacting one of the rewind drums and the roll carriers of the other support being capable of contacting the other of the rewind drums.

2. A rewinding section of a slitting machine for accommodating to the slitting of a relatively wide web of material into a plurality of narrower webs windable into individual rolls comprising:

a pair of roll support assemblies disposed adjacent the slitting machine and each including an elongated support and a plurality of individual roll carriers mounted on the support,

the assemblies each being pivotable about an axis adjacent one end of the slitting machine and arrangeable between a first configuration wherein one assembly is extendable across the machine in a rewind position for the winding of the webs onto the cores thereof and the other assembly is in an unload position and a second configuration wherein the positions of the assemblies are reversed,

the pair of assemblies being mounted for pivotal movement about vertical axes disposed symmetrically about a centerline of the machine and spaced apart by a distance slightly greater than the length of the respective supports, and the end of each assembly remote from its pivot being provided with a support roller.

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