United States Patent [19]

Schnettler

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[54] **DRIVE UNIT FOR CONTINUOUSLY OPERATING SHEET PROCESSING OR TREATING LINES**

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[52] **U.S. Cl.** **74/221**

[51] **Int. Cl.** **F16h 7/00**

[58] **Field of Search** 74/221, 203

[56] **References Cited**

UNITED STATES PATENTS

2,664,758 1/1954 Smits 74/221

FOREIGN PATENTS OR APPLICATIONS

131,165 8/1901 Germany 74/221

664,352 3/1935 Germany 74/221

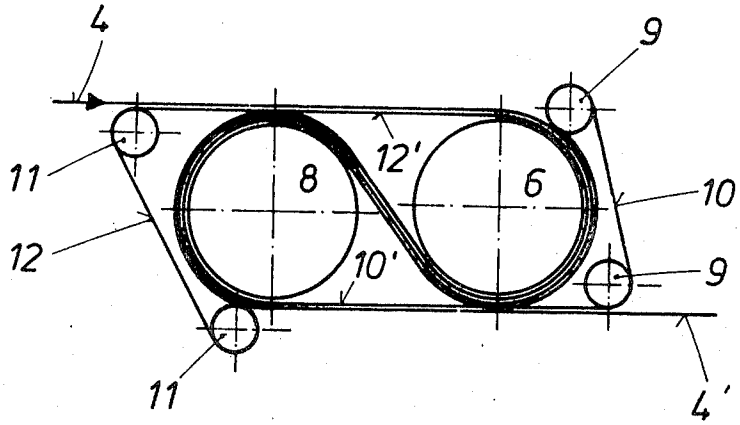
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[57] **ABSTRACT**

In a drive unit for sheets to which a traction must be applied, especially in S-roller frames, belt winding means are used to increase the pressing surface between the sheet and the reversing rollers.

2 Claims, 4 Drawing Figures



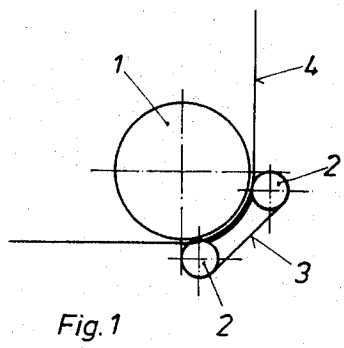


Fig. 1

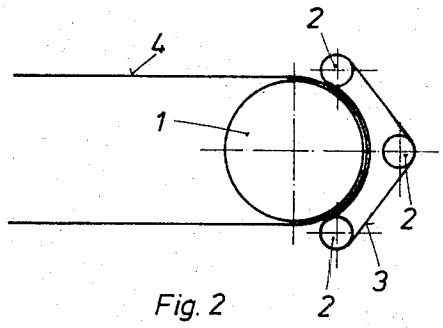


Fig. 2

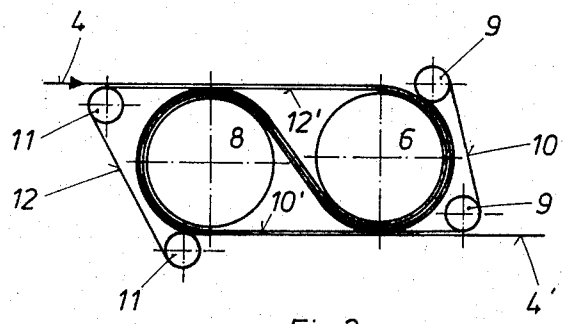


Fig. 3

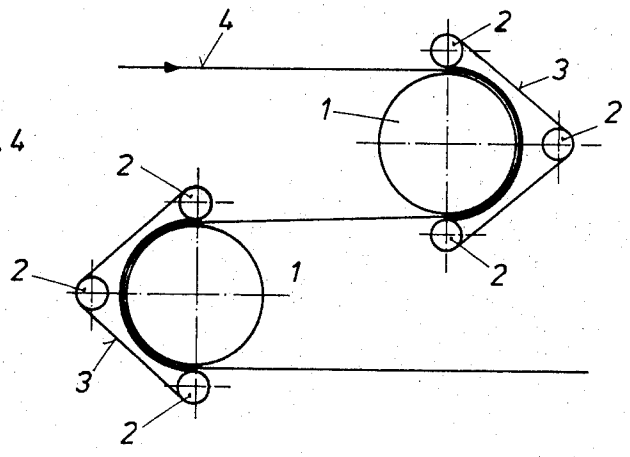


Fig. 4

DRIVE UNIT FOR CONTINUOUSLY OPERATING SHEET PROCESSING OR TREATING LINES

The invention relates to a drive apparatus for continuously operating sheet processing or treating lines, consisting of at least one reversing roller and at least one pressing roller for generating the initial traction of the sheet.

In continuously operating sheet processing lines the sheet transport is usually obtained by drive means or by so-called S-roller frames. These S-roller frames are chosen as far as possible over the drive means, because the traction forces to be generated by the drive means are limited, with high pressing forces a deformation of the sheet may occur, and a lateral displacement of the sheet is also not positively excluded. In an S-roller frame the traction force is generated by the friction force due to the double reversing action of the sheet around reversing rollers at large angles of contact. However, this presupposes the possibility of applying an initial traction to the sheet which enters the S-roller frame, and for this purpose one either disposes a drive means ahead of the S roller frame, or a pressing roller in the region of the first reversing roller of the S-roller frame. The invention is directed to such an arrangement, because a drive means is subjected to the above mentioned disadvantages. On the other hand only a limited initial traction can be produced by means of a pressing roller.

On the basis of the utilization of pressing rollers the invention solves the problem of improving the conditions in such a way that greater initial tractions may be produced. In accordance with the invention this is obtained by the use of a belt winding means customary in strip or tape reels to replace the pressing roller, the belt of the belt winding device producing accordingly a more or less increased friction connection between the sheet and a reversing roller. Within the scope of this invention the belt winding device is utilized for a new purpose in the sense that in continuously operating sheet installations the aim is not to catch a sheet travelling at high speed in order to wind it on a reel, which has been its sole purpose in its utilization known so far in combination with a strip or tape reel.

In an S-roller frame the friction contact of an incoming sheet may still be increased by an arrangement wherein the belt of the belt winding device disposed at the inlet side, which presses the incoming sheet against the first reversing roller and travels in the form of an S around the second reversing roller, is guided back over two smaller reversing rollers. In this way the angle of contact is increased in the region of the first reversing roller to more than 180°. If an additional belt winding device is substantially symmetrically associated with the second reversing roller, and the belt of this additional belt winding device is guided in the form of an S around the first reversing roller the sheet is also pressed in the region of the second reversing roller over an angle of contact of more than 180° positively against this roller. The sheet is then sandwiched between two belts of the two belt winding means when it travels around the two reversing rollers.

A few embodiments of a drive unit for continuously operating sheet processing lines according to the invention are shown in the drawings, wherein:

FIG. 1 represents a belt winding means having small reversing rollers 2 and a belt 3 for generating a friction contact between a sheet 4 for a 90° reversing action of the sheet around a reversing roller,

FIG. 2 represents a belt winding means with three small reversing rollers 2 for a 180° reversing action of the sheet 4,

FIG. 3 is a symmetrical arrangement of two belt winding means in combination with an S-roller frame, and

FIG. 4 is a similar arrangement as in FIG. 2 for a double reversing action of 180° each, and illustrating a vertical displacement.

The arrangements according to FIGS. 1, 2 and 4 are selfexplanatory and need not be further explained in view of the above description.

FIG. 3 shows an especially advantageous embodiment of a drive unit in combination with an S roller frame consisting of the two driven reversing rollers 6 and 8. In the region of the reversing roller 6 located on the inlet side a belt winding means having two small reversing rollers 9 is provided, whose belt 10 presses the incoming sheet 4 over an angle of contact of more than 180° against the reversing roller 6. This large angle of contact is obtained by the fact that the belt 10 is guided around the second reversing roller 8, and is guided back to the small reversing rollers 9 past the first reversing roller 6 in the region 10. However, in the embodiment of FIG. 3 also in the region of the second reversing roller 8 a higher friction contact is provided between the sheet 4 and the roller in that the belt 12 of a second symmetrically arranged belt winding means comprising the small reversing roller 11 is guided in a region 12' directly around the first reversing roller 6 and surrounds the incoming sheet 4 in the region of the second reversing roller 8 over an angle of contact of more than 180°, and is then guided back to the two small reversing rollers 11. In this way the sheet which leaves at 4' is sandwiched in the region of the two reversing rollers 6 and 8, so that the belt which travels on the outside presses the sheet over a large angle of contact against the associated reversing roller. In the region of the roller 6 this is the belt 10 and in the region of the roller 8 the belt 12 takes over this task.

What is claimed:

1. A tension roll assembly for regulating forward or back tension on a moving strip in strip processing lines comprising a pair of spaced first and second reversing rollers over which the strip is wound in an S-shaped configuration, and an endless belt winding means to increase friction between said strip and said reversing rollers, wherein said endless belt is guided initially in contact with the strip wound over said first reversing roller, then in contact with said second reversing roller and back over two spaced smaller guide rollers positioned in different radial planes of the first reversing roller, one of said guide rollers determining the back pass of said belt free of said first reversing roller.

2. A tension roll assembly according to claim 1, including a second endless belt winding means comprising two spaced smaller guide rollers positioned in different radial planes of said second reversing roller and a belt guided free of said second reversing roller along the incoming strip, then in contact and around said first reversing roller and in contact with the strip around the second reversing roller back to the two spaced guide rollers.

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