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(54) Dancer roller device.

(57) A device of this invention includes a plurality of stationary guide rollers (2) and a plurality of movable guide rollers (4) arranged on one side of the stationary guide rollers (2). The movable guide rollers (4) can approach/separate from the stationary guide rollers (2). A strip-like material (A) is extended among the stationary and movable guide rollers (2; 4) in a zigzag manner. When the strip-like material (A) is set, the movable guide rollers (4) are moved to the other side of the stationary guide rollers (2) through gaps between the stationary guide rollers (2). The strip-like material (A) is linearly inserted between the movable guide rollers (4) moved to the other side and the stationary guide rollers (2), and thereafter, the movable guide rollers (4) are returned to the one side of the stationary guide rollers (2).

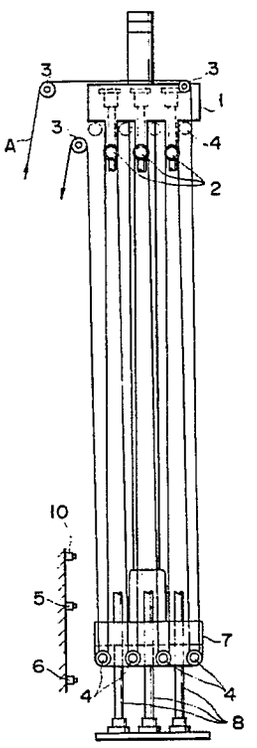

FIG. 1

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Dancer roller device

The present invention relates to a dancer roller device which accumulates a portion of a strip-like material, e.g., continuous strip-like wrapping paper for wrapping cigarettes, and absorbs a difference between feed-in and feed-out amounts of the strip-like material.

Conventionally, a dancer roller device is often arranged midway along a path for conveying a strip-like material. The dancer roller device accumulates a portion of a conveyed strip-like material, and when feed-in and feed-out amounts of the strip-like material are different from each other, it absorbs the difference.

A conventional dancer roller device generally has the following structure. That is, the conventional dancer roller device comprises a plurality of stationary guide rollers and a plurality of movable guide rollers. These movable guide rollers can approach or separate from the stationary guide rollers. A strip-like material is extended among these stationary and movable guide rollers in a zigzag manner. The movable guide rollers approach or separate from the stationary guide rollers to change an amount of the strip-like material accumulated in this dancer roller device, thereby absorbing a difference between feed-in and feed-out amounts of the strip-like material.

However, when a strip-like material is set in the conventional dancer roller device, the strip-like material must be extended among a large number of rollers in a zigzag manner. For this reason, the setting operation of a strip-like material is cumbersome, resulting in an inefficient operation.

The present invention has been made to eliminate the drawbacks of the conventional dancer roller device described above, and has as its object to provide an efficient dancer roller device which can facilitate a setting operation of a strip-like material.

The object of the present invention can be attained by the following arrangement. That is, the device of the present invention comprises a plurality of stationary guide rollers, and a plurality of movable guide rollers which are arranged on one side of, e.g., below the stationary guide rollers. The movable guide rollers can approach or separate from the stationary guide rollers. A strip-like material is extended among these stationary and movable guide rollers in a zigzag manner. The movable guide rollers can pass through gaps between adjacent stationary guide rollers, and can be moved to the other side of, e.g., above the stationary guide rollers.

In the dancer roller device of the present invention, the movable guide rollers are located below the stationary guide rollers in a normal operation mode. A strip-like material is extended among these movable and stationary guide rollers in a zigzag manner. When the strip-like material is cut and is set again, or when a new strip-like material is set, the movable guide rollers are moved to a position above the stationary guide rollers through gaps between adjacent stationary guide rollers. Then, the strip-like material is linearly inserted between these movable and stationary guide rollers. The movable guide rollers are then moved to a position below the stationary guide rollers through gaps between adjacent stationary guide rollers. Thus, the strip-like material can be extended among the stationary and movable guide rollers in a zigzag manner.

According to the device of the present invention, a strip-like material can be set by only inserting it between the stationary guide rollers and the movable guide rollers moved to an upper position, and a setting operation of the strip-like material is easy and efficient.

This invention can be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a front view of a dancer roller device according to the present invention; and

Fig. 2 is a partial sectional side view of an upper portion of the dancer roller device of the present invention.

A dancer roller device according to an embodiment of the present invention will be described hereinafter. The device of this embodiment is a dancer roller device arranged midway along a path for supplying strip-like wrapping paper for wrapping cigarettes.

The dancer roller device shown in Fig. 1 comprises a frame 1. Three stationary guide rollers 2, for example, are rotatably mounted on an upper portion of the frame 1. These stationary guide rollers 2 are arranged at the same level position to be separated at equal intervals in the horizontal direction.

The dancer roller device comprises four movable guide rollers 4 which are moved together in accordance with a difference between feed-in and feed-out amounts of a strip-like material, i.e., a wrapping material A guided through a plurality of guide rollers 3 which define a portion of a convey path. The wrapping material A of a predetermined length can be accumulated by these movable guide rollers 4. The basic operational structure of the movable guide rollers 4 is known to those who are skilled in the art, and a detailed description

thereof will be omitted here. Upper and lower limit sensors 5 and 6 for respectively detecting upper and lower limit positions of the movable guide rollers 4 are fixed on a lower portion of the dancer roller device. The movable guide rollers 4 are positioned between the upper and lower limit sensors 5 and 6 in accordance with detection signals from the upper and lower limit sensors 5 and 6. More specifically, an unrolling speed of a feed roller (not shown) arranged at an upstream side of the dancer roller device in the convey path is controlled on the basis of the detection signals from the upper and lower limit sensors 5 and 6.

The four movable guide rollers 4 will further be described below. The movable guide rollers 4 are rotatably mounted on a lift carrier 7. Of the movable guide rollers 4, inner two rollers are located below and between the stationary guide rollers 2, and the remaining movable guide rollers 4 are located below and outside the stationary guide rollers 2.

The lift carrier 7 is guided by three guide rods 8 to be vertically movable. The lift carrier 7 is vertically moved as needed by a rodless cylinder 9 constituting a moving mechanism. In this case, the upward movement limit of the lift carrier 7 by the rodless cylinder 9 is set above the stationary guide rollers 2. As can be seen from Fig. 2, therefore, the movable guide rollers 4 can be moved upward beyond the stationary guide rollers 2. In this manner, when the movable guide rollers 4 are located above the stationary guide rollers 2, an insertion path B of the wrapping material A is formed between these stationary and movable guide rollers 2 and 4.

Therefore, when the wrapping material A guided through the convey path is extended among the stationary and movable guide rollers 2 and 4 or when the wrapping material is accidentally cut and must be extended again, the wrapping material A is simply inserted in the insertion path B, and thereafter, the movable guide rollers 4 are returned to a normal lower position, thus allowing easy extension of the wrapping material A.

When the unrolling operation of the wrapping material S is stopped in the entire convey path, the rodless cylinder 9 is operated. Therefore, the movable guide rollers 4 are moved to a position defined by a sensor 10, thereby preventing the wrapping material A from being folded.

As described above, according to the dancer roller device of the present invention, since the movable guide rollers can be located at an upper position above the stationary guide rollers, a strip-like material need only be inserted in the insertion path defined between the movable and stationary guide rollers, thus facilitating extension of the strip-like material with respect to the guide rollers.

Claims

1. A dancer roller device which is adapted to be arranged midway along a convey path of a strip-like material, and comprises a plurality of stationary guide rollers, and movable guide rollers arranged on one side of said stationary guide rollers, said movable guide rollers being able to approach/separate from said stationary guide rollers, the strip-like material being extended between said stationary and movable guide rollers in a zig-zag manner, and said movable guide rollers approaching/separating from said stationary guide rollers to absorb a difference between feed-in and feed-out amounts of the strip-like material, characterized by comprising:
moving means (7, 8, 9) for moving said movable guide rollers (4) to the other side of said stationary guide rollers (2) through gaps between said stationary guide rollers (2) when the strip-like material (A) is set.

2. A device according to claim 1, characterized in that said stationary guide rollers (2) rotatably project from a main body frame (1) in a cantilever manner, said moving means (7, 8, 9) comprises a carrier (7) movable relative to said frame (1), and said movable guide rollers (4) rotatably project from said carrier (7) in a cantilever manner.

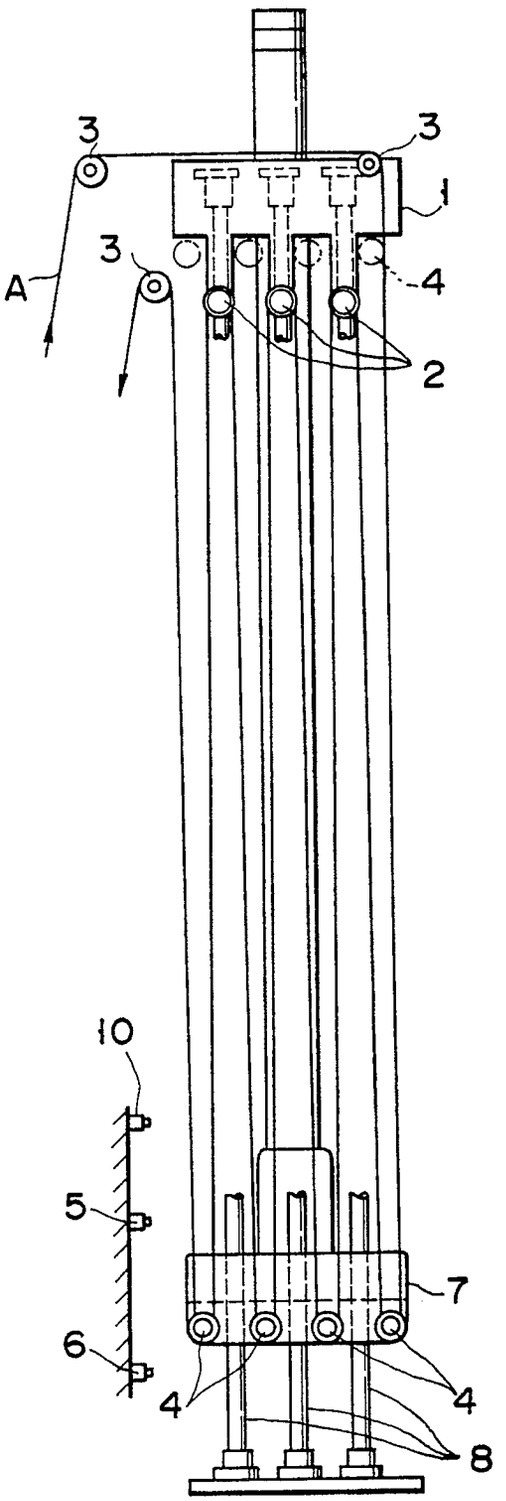

FIG. 1

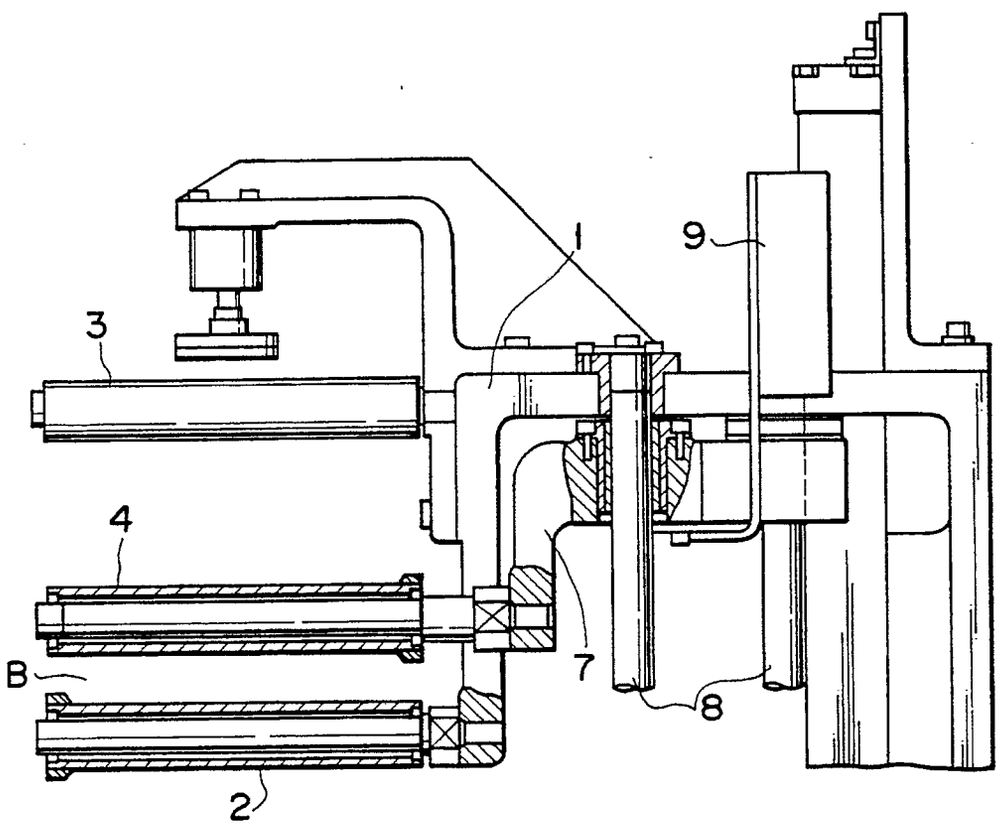

FIG. 2