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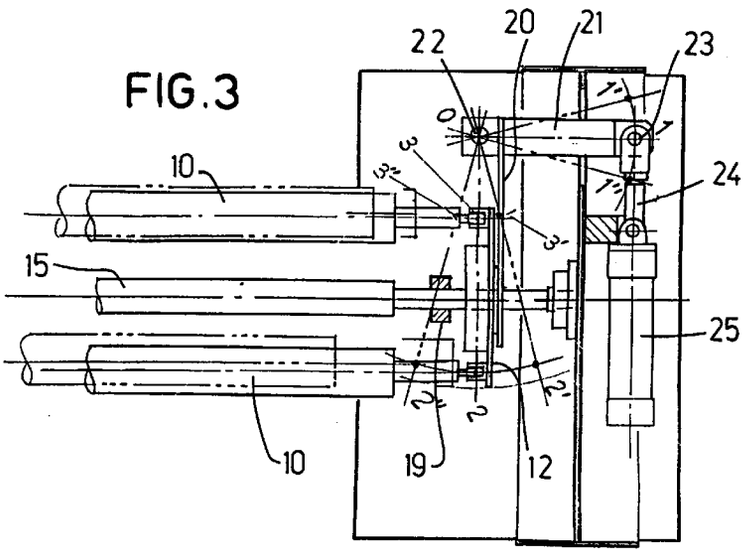
(54) A device for transversally aligning a fabric or knitted fabric strip

(57) In a device for transversally aligning a fabric or knitted fabric strip (26) advancing longitudinally, the strip is wound around oscillating and/or translating aligning cylinders (10) connected to a sensor (27) for detecting lateral movement of the strip and moving the cylinders correspondingly so as to take the strip back in its correct longitudinal direction of advancement when said strip undergoes a lateral deviation. The aligning cylinders (10) are idly mounted on respective shafts (11) equally spaced on an ideal cylindrical surface and pivotally mounted at their ends (13) to a support (12). A motor (16) rotates the support (12) about a first central axis (15) disposed centrally with respect to the cylinders (10) and oscillates about a second axis (22) substantially perpendicular to the first axis (15). An actuator (25) is controlled by the sensor (27) and connected to the rotating support (12) so as to oscillate and shift each of said cylinders (10) a different distance with respect to the others.

FIG.3



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Description

The present invention relates to a device for transversally aligning a fabric or knitted fabric strip advancing in a longitudinal direction.

There are known apparatuses for longitudinally aligning strips, particularly in the textile industry for aligning fabric or knitted fabric strips advancing along a processing line.

However, these prior art apparatuses suffer from several inconveniences. Some of them are particularly cumbersome, having components extending sideways or along the strip's direction of advancement. Others are rather complex and are therefore have been found to be susceptible to breaking, whereby frequent maintenance interventions are required.

Still other apparatuses make use of parts engaging the strip frictionally, whereby there is the risk of breaking or damaging the strip.

It is an object of the present invention to provide a device for transversally aligning a strip, the device having a reduced bulk on all of its sides. It is desired to provide a device simple to apply and of variable efficiency according to requirements.

It is another object of the present invention to provide a device having no components frictionally engaging the advancing strip. A still further object is to provide a device capable of working also when the strip is not moving and which is automatically self-adapting to the advancing speed of the strip.

These and other objects are achieved by a device as defined in appended claim 1. Advantageous embodiments of the invention are defined in the dependent claims.

The objects, advantages and features of the present invention will become readily apparent to those skilled in the art from a study of the following description of an exemplary preferred embodiment when read in conjunction with the attached drawings, in which:

FIG. 1 is a partially sectioned front view of a device according to the present invention;

FIG. 2 is a cross-sectional view along the line II-II of FIG. 1;

FIG. 3 is a cross-sectional view along the line III-III of FIG. 2; and

FIG. 4 is a cross-sectional view along the line IV-IV of FIG. 2.

In the drawings there is illustrated a set of cylinders 10 idly mounted on respective shafts 11; in this exemplary embodiment eight cylinders are provided. Each end portion of the shafts 11 is hinged at 13 to a respective flange 12 (in Figure 1 only one flange is shown for simplicity), in such manner that the axes of said shafts are parallel and disposed on an ideal cylindrical surface.

Each flange 21 is mounted on bearings 14 for rotating about a central axis coinciding with the axis of a central shaft 15 rotated by a motor 16 and mounted on bearings 17. To the free end of central shaft 15 there is fixed a fork 18 the fingers of which engage one of the shafts 11 of cylinders 10. In this way, the rotational motion is transmitted by motor 16 through central shaft 15 to a cylinder 10 and from the latter to all the cylinders, as all are mounted on the flange 12.

The flange 12 rotates on a support or bracket member 20 extending sideways to an arm 21 hinged at 22 for rotating about an axis perpendicular to the plane of FIG. 3.

Arm 21 is hinged at the other end 23 to the stem 24 of an actuator 25. In the attached drawing, actuator 25 is a pneumatic cylinder, but it is understood that it could also be an electro-mechanical device.

The strip 26 is wound around the group of idle cylinders 10, as shown in the drawings.

Upstream of the device, i.e. at the output of strip 26, there is provided a conventional sensor device 27 for detecting alignment of the fabric with respect to the rectilinear direction of advancement.

This detecting device, of conventional type, is operatively connected to cylinder 25 in order to retract or extend the stem 24 responsive to the amount of misalignment detected (to the right or the left) on the advancing fabric strip.

From position 1, the arm 21 will alternately reach angular positions 1' or 1"; accordingly, the hinges 13 of shafts 11 will shift from positions 2 and 3 to positions 2'-3' or 2"-3", respectively.

This means that the cylinders 10 will translate parallel to their axes and reach the positions illustrated in phantom in FIG. 3.

The different amount of sliding movement of cylinders 10 in either direction will provide for re-alignment of the strip 26 as a function of the amount of misalignment detected by the device connected to cylinder 25.

By suitably adjusting the rotational speed of the set of cylinders 10, the device of this invention allows to change the effect and efficiency of the strip alignment also when the speed of the strip is zero, i.e. when the strip is simply stretched on the cylinders that are oscillated as previously discussed translating the fabric laterally in either direction.

The system can be used also as a supplementary driving device for conveying the strip, without encountering speed synchronicity problems and involving additional costs.

If desired, instead of using idle cylinders 10, fabric widening rollers could be utilised to provide a further widening effect besides aligning the strip 26.

Claims

1. A device for transversally aligning a fabric or knitted fabric strip advancing longitudinally, said strip being wound around oscillating and/or translating aligning cylinders connected to sensor means (27) for gauging lateral movement of the strip and moving said cylinders correspondingly so as to take the strip

back in its correct longitudinal direction of advancement when said strip undergoes a lateral deviation, characterised in that said aligning cylinders (10) are idly mounted on respective shafts (11) substantially equally spaced on an ideal cylindrical surface and pivotally mounted at their ends (13) to a support (12) rotating about a first central axis (15) disposed centrally with respect to said cylinders (10) and oscillating about a second axis (22) substantially perpendicular to said first axis (15); actuator means (25) being controlled by said sensor means (27) and being connected to said rotating support (12) so as to accomplish said oscillation and shift each of said cylinders (10) a different distance with respect to the others; there being provided driving means (16) for rotating said support (12) about said central axis (15).

2. A device according to claim 1, characterised in that there are eight aligning cylinders (10); a fork (18) being fixed for rotation with a shaft (15) having its axis coinciding with the rotation axis of said support (12), the fingers (19) of said fork engaging the shaft (11) of one of said cylinders (10).

3. A device according to claim 1, characterised in that said support (12) rotates on a bracket (20) extending sideways to an arm (21) hinged to said second axis (22) on one side and to the stem (24) of said actuator means (25) on the other side.

4. A device according to claim 1, characterised in that said support (12) is a circular flange

5. A device according to claim 1, characterised in that the sensor means (27) are comprised of at least one photoelectric cell and that said actuator means connected thereto consist of a pneumatic cylinder.

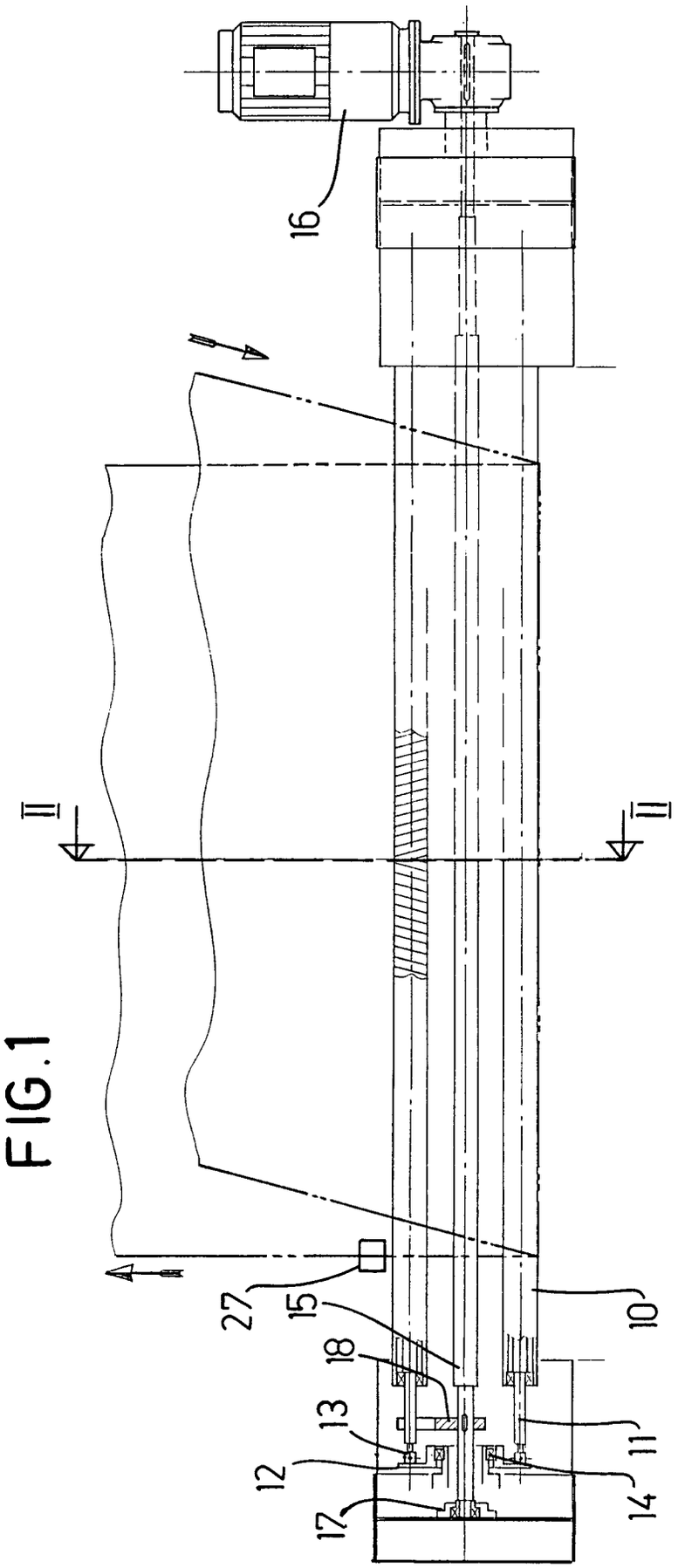

FIG.1

FIG.3

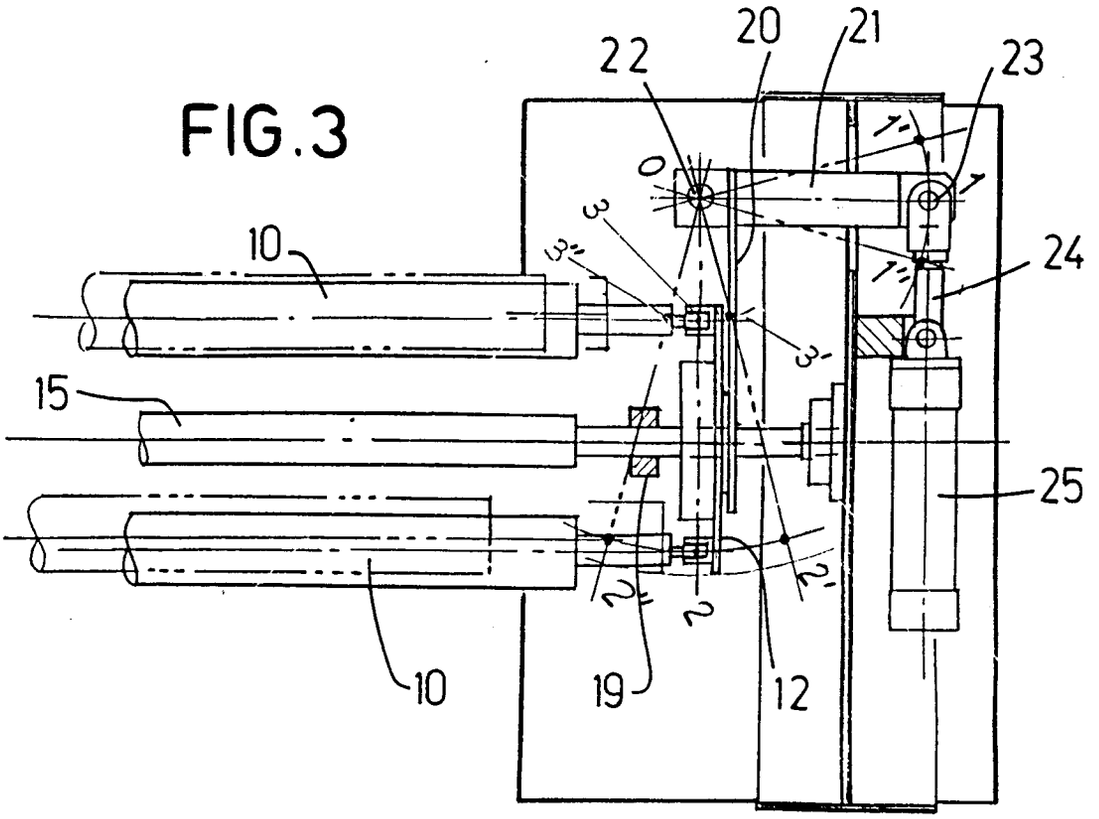

FIG.2

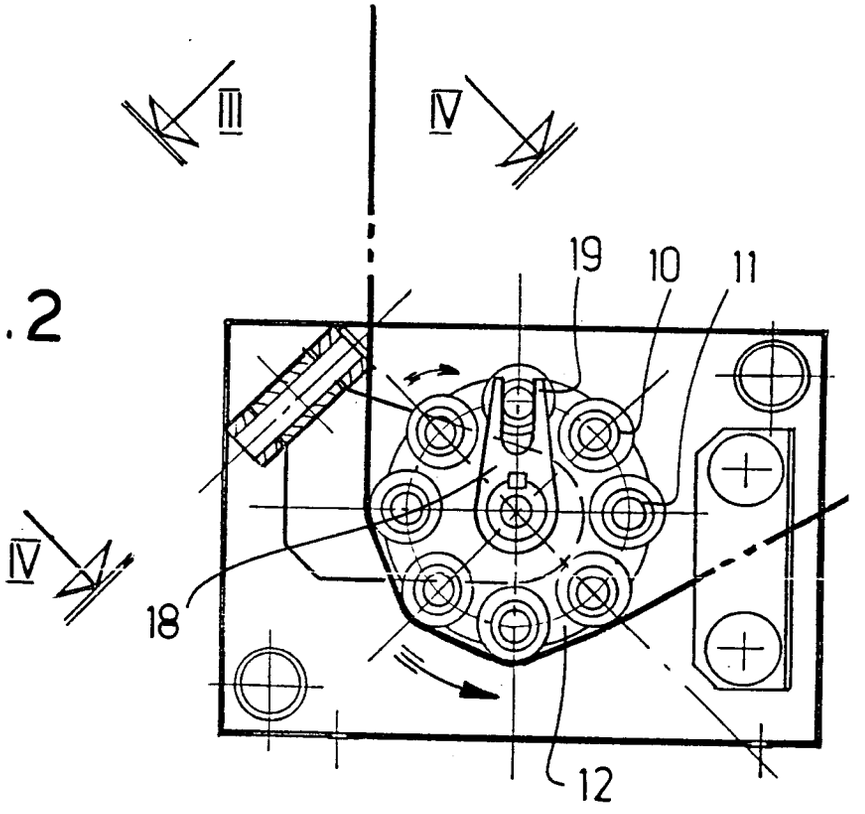

FIG. 4