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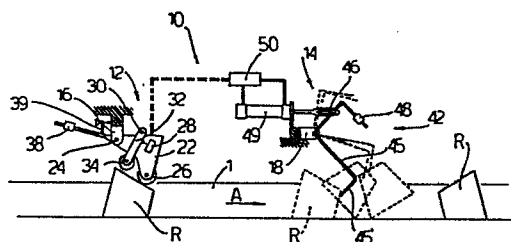
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54 A detector-tilter device for arranging in a same attitude tapered bodies supplied aligned with casual attitude.

57 A detector-tilter device for arranging in a same attitude frusto-conical bodies, generally aligned yarn reels, comprises a detecting unit (12) to detect the reel attitude, a tilting unit (14), operating means (50, 49) between the detecting unit (12) and the tilting unit to cause or not the operation of the tilting unit as a function of a situation signalled by the detecting unit (12), said tilting unit comprising an element or bar (42) pivoted to a stationary member according to an axis transversely of the body feeding direction; said element being movable between a lowered position and a lifted position, at lowered position interfering with the minor base of the feeding bodies, the distal end of the element forming an angle with respect to the bottom base of said bodies.

FIG.2



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"A DETECTOR-FILTER DEVICE FOR ARRANGING IN A SAME ATTITUDE
TAPERED BODIES SUPPLIED ALIGNED WITH CASUAL ATTITUDE"

- The device has been particularly designed with reference to the field of yarn reels or cones, that is substantially rigid yarn windings of frusto-conical tapered shape, it appearing however that it may be used for bodies of any shape, provided that such
5. bodies are tapered from a base of mayor cross-section area to a base of minor cross-section area.

- In a system (plant) for handling yarn reels, (forming the subject of a cooending application of the same applicant), the reels are feeded forward along a runway or run path in aligned arrangement;
10. the reels are arranged in a laid down position, that is with a cone generatrix at substantially horizontal position or however parallel to the runway axis. However, the aligned reels have a

casual attitude, that is some have the major base upstream with respect to the feeding direction, while others have the major base downstream of the feeding direction.

Due to system requirements, it is essential that the reels should have a same attitude or arrangement, that is particularly with the major base facing in forward direction and the minor base facing in rearward direction with respect to the feeding direction.

From FR-A-1,605,254 a device is known for orienting frusto-
10. conical spinning cops, which comprises a blade pivoted according an axis parallel to the cop advancement and arranged to interfere with the major base thereof. The blade is effective to allow the advancement of corps, which have the minor base forward directed, and to eject those cops which have the major base forward
15. directed. Therefore, such a device solves a problem other than that of the above mentioned applicant's system, and cannot be adapted to such a system.

From DE-A-2,201,013 orienting device or apparatus is known for conical spools which, device, as the one previously mentioned,
20. arranges the spools with the minor base forward directed. The apparatus comprises a suringing tubular container and in no way cannot be adapted to substantially horizontal paths or to arrange frusto-conical bodies with the major base forward directed.

Therefore, the device of this applicati~~on~~ was conceived, which

- device substantially comprises a detecting unit to detect the reel or tapered body attitude, hereinafter sometimes referred to as "detector" and a tilting means or unit; operating means interposed between said detecting unit and tilting unit, to cause
5. the operation or not of the latter unit as a function of the former unit, said tilting unit comprising a bar element pivoted on a stationary member according to an axis transversely of the body feeding or advancement, said element being movable between a lowered position and a lifted position, at lowered position
 10. interfering with the minor base of the advancing bodies, the distal end of the element forming an angle with respect to the lower base of said bodies.

- According to an embodiment, the detecting unit comprises a first detecting means movably carried on a stationary portion and
15. normally located in said runway at such a height as to interfere with said tapered bodies, a second detecting means carried by a portion integral with the first detecting means and movable relative thereto, and normally arranged in said runway at a level just lower than the upper end of the major base of the
 20. frusto-conical body, said first and second detecting means being so arranged that a tangent to both is inclined relative to the runway by a larger angle than the angle of inclination between the major base and minor base of the surface being contacted therefrom.
25. A control member for said means is interposed between said first and second detecting means for operation by mutual displacement

thereof.

Generally, the operating means comprise a cylinder piston unit, the movable part of which is connected to the arm of the tilting unit. Generally, the first detecting means is integral with a
5. plate pivoted on said fixed or stationary portion, and the second detecting means is carried on a link rod pivoted to said plate for rotation relative thereto.

According to a variant, an electronic type of detecting circuit for the reel attitude can be provided, comprising a first
10. photocell set arranged spaced apart from a second set, connected to a processing circuit including, for example, bistable means for emitting a signal to be sent to the tilting unit.

According to a preferred solution, each of said two photocell sets comprise at least one photocell to detect anyhow the reel
15. passage, and at least another photocell, positionable at different heights, to detect the reel height, which can be varied according to the reel tapering and size.

In turn, each photocell unit can be enabled by at least another photocell.

20. The novel device provides for the ordering of reels or generally tapered bodies selectively tiltable to present at the outlet all of such tapered bodies arranged with the major base downstream and the minor base upstream.

Hereinafter, an embodiment of the invention will be described by way of unrestrictive example with reference to the accompanying drawings, in which:

- Fig. 1 is a perspective view of the device at idle condition;
5. Fig. 2 is a schematic side view of the device, showing by dashed lines work steps where a reel is presented at uncorrect attitude;
- Fig. 3 is a view similar to Fig. 1, wherein the device is shown when having a reel at correct attitude;
10. Fig. 4 is a schematic side view of the device according to a variant, in which electronic means are provided for detecting the reel attitude and supplying a suitable signal to the tilting unit, therein showing by dashed lines those work steps where a reel is presented with
15. uncorrect attitude; and
- Fig. 5 is an exemplary view of processing circuit for the signals as detected by the photocells of Fig. 4.

Fig. 1 shows a runway 1 for frusto-conical yarn reels R moving therealong in the direction of arrow A.

20. A detector-tilter device 10 comprises a detecting unit 12 and a tilting unit 14 respectively applied to a first stationary bridge 16 and a second stationary bridge 18 (in case adjustable in height) on the runway, the second bridge being downstream of the first bridge with respect to the reel advancement.
25. The detecting unit comprises a rigid support 20 rigidly attachable to the bridge and a plate 22 is carried by said support 20 and pivoted at 24 thereto to oscillate about a

horizontal axis. At the bottom, said rigid plate 22 carries a first roller or wheel 26 which is freely rotatable, or other detecting element for sliding or rolling on a reel being advanced in the direction of arrow A.

5. Said plate 22 also carries a microswitch 28. At the top, said plate 22 carries a pin 30 on which a connecting rod 32 is rotatably carried and at the end carries a second roller or wheel 34 or equivalent detecting means. A surface of the connecting rod 32 cooperates with a control button 28' of the
10. microswitch 28. An arm 36, integral with plate 22, extends from the opposite side thereof with respect to pin 24 and carries an adjustable balance weight 38.

The part arrangement is adjustable so that, at the idle position shown in Fig. 1, the roller or wheel 34 is at a higher level than

15. roller or wheel 26, but at a lower level than that of the highest point of reel R, and an imaginary tangent 40 to the two rollers or wheels form with the horizontal an angle α not less than angle β formed, with the same direction, by the upper face of an advancing reel (or anyhow by the face of the reel intended to
20. come in contact with the detecting rollers or wheels).

The plate 22 is retained (by the balance weight 38, in case with the aid of a registering means, such as 39 in Fig. 2) at a balance condition, in which the detecting means can interfere with an advancing reel. The connecting rod 32 is maintained at lowered

25. condition or idle condition by its own weight, or by spring means, or the like.

The tilting unit 14 comprises a rigid bar element 42, pivoted to

a support or mounting 44 integral with the crosspiece 18, to be rotatable about an axis 43 transversely of the reel axis, or to the reel movement direction. This element 42 comprises an angled lower arm 45 and an upper arm 47 carrying a weight 48 at the same
5. side of the angled arm relative to the pin, so as to urge said arm 45 to a lowered position. The angled portion 45' of arm 45 has such a configuration as to angularly cut into the front face of an advancing reel.

A lowered limit position of said element 42 is defined in any
10. desired manner, such as by a retaining ring 46 integral with the stem of a cylinder piston unit 49, the latter being controlled by said microswitch 28 through an air or fluid slide valve 50.

The distal end of arm 45 is normally urged by weight 48 to a position of interference with a reel advancing on runway 1. Of
15. course, a spring performing the same function could be provided instead of such a weight 48.

Hereinafter, the operation of the device will be described with reference to Figs. 2 and 3.

In Fig. 2, a reel R is advancing in the direction of arrow A with
20. the minor base ahead, that is with uncorrect attitude.

At station 12, the frusto-conical reel R first encounters the roller or wheel 26 and, as said reel R forward moves, said roller or wheel 26, moving along an upper generatrix of the frustrum of cone, rotates about said pin 24 being lifted and thus also
25. lifting said roller or wheel 34, which accordingly never comes in contact with the reel. The microswitch is not energized, the

cylinder-piston unit 49 is not operated and the tilting unit 14 remains at lowered condition. Then, on continuing its travel, said reel R strikes against the arm 45 of the tilting unit, which is maintained at lowered position by the weight action. The

5. engagement of arm 45 on the reel tilts the latter by various step movement, shown by dashed line in Fig. 2, so that at the outlet of device 10 the reel R is at the desired attitude, i.e. with the major base forwardly facing.

On the other hand, Fig. 3 shows the case where the runway 1 has

10. thereon an already correctly oriented reel R' with the major base ahead. This reel R' first strikes with its major base against the roller or wheel 34, so that the connecting rod 32 moves relative to plate 22 and energizes the microswitch 28, the latter controlling the cylinder piston unit 49 through the air slide

15. valve 50. The stem of the cylinder piston unit is retracted, so that the arm 45 is lifted out of the path of reel R', which continues thereby its travel without interferences.

An electronic detecting unit of the reel attitude could also be provided for supplying a suitable electric signal.

20. Fig. 4 shows the application of photocell means to an apparatus comprising a tilting unit 14 of the above described type. As previously described, the mechanical detecting unit 12 could be provided or not.

Thus, the electronic detecting unit, to be described in the

25. following, can alone supply a suitable operating signal to the tilting unit 14, or be placed side by side to the mechanical

- detecting unit 12 as an auxiliary control device for correct operation of the mechanical detecting unit. The electronic device comprises a set of photocells Fa, Fb, Fc, Fd, Fe, Fl, Fg, Fh, respectively, arranged as shown in Fig. 4. Particularly, the
5. photocells Fa, Fd are useful to detect the presence of reels of different sizes. The signals detected by these photocells are inserted in bistable electronic devices B1, B2, B3, respectively.

An example of possible processing circuit diagram for the signals detected by the photocells is shown in Fig. 5.

10. The operation of the device, to which a circuit as that of Fig. 5 has been applied, will now be described.

Assume that the reel R is forward moved in the direction of the arrow with the minor base ahead, that is with uncorrect attitude.

- According to Fig. 4, at station A, energization is given to
15. photocell Fc and, at the end of the passage thereof, to photocell Fb. On arriving at station D, the reel first enables the photocell Fg and after some time the photocells Fl and Fe. According to the circuit of Fig. 5, at the output of component I5 there is a signal for maintaining the tilting unit at lowered
 20. position. Should the circuit be used with the detecting unit 12, further enabling signal is provided in addition to that provided by the detecting unit.

- Should the reel arrive at station A with correct attitude, only the photocell Fc is enabled at the end of passage thereof. Then,
25. at station D only photocell Fl is enabled by photocell Fg. If

present, the signal from element I5, in case combined with that of the mechanical detecting unit 12, will cause the tilting unit 14 to be lifted and the reel will advance in correct attitude with rearwardly facing tapering. Finally, the reel energizes the

5. photocell Fh, causing the tilting unit to be lowered again. The reel is ready for a next step.

Thus, by a simple circuit, an electronic means can be provided for checking the reel attitude.

C L A I M S

1. A detector-tilter device for arranging tapered bodies, i.e. reels in a same attitude in a runway, said bodies being tapered from a major base to a minor base, the bodies being supplied in an aligned laid down condition with casual attitude,
5. characterized by comprising a detecting unit to detect the reel attitude, a tilting unit (14), operating means (50, 49) between said detecting means and tilting unit to cause or not the operation of the tilting unit according to a situation signalled by the detecting unit, said tilting unit comprising a bar element
10. (42) pivoted on a stationary member according to an axis transversely of the body forward movement, said element being movable between a lowered position and a lifted position, said element, when at lowered position, interferring with the minor base of the bodies being advanced.
15. 2. A device as claimed in Claim 1, characterized in that said reel attitude detecting unit comprises a first detecting means movably carried on a stationary portion and normally located in said runway at such a height as to interfere with said tapered bodies; a second detecting means carried integrally with
20. the first means and movable with respect to said first detecting means, said second means being arranged at a lower level than the highest point of the body, but higher than that of the first detecting means, said first and second detecting means being

arranged so that a tangent to both said means is inclined relative to the runway by a larger angle than the angle of the body surface with which they come in contact; and a control member (28) of said operating means interposed between said first
5. and second detecting means for operation by the mutual movement thereof.

3. A device as claimed in Claim 1, characterized in that said operating means comprises a cylinder piston unit, the movable part of which is connected to the tilting unit arm.

10. 4. A device as claimed in Claim 2, characterized in that said first detecting means is integral with a plate pivoted on said stationary portion, and said second detecting means is carried on a connecting rod pivoted on said plate to rotate relative thereto.

15. 5. A device as claimed in Claim 4, characterized in that said control member is integral with the plate.

6. A device as claimed in Claim 1, characterized in that the tilting unit is maintained at lowered position by a weight and urged to lifted position by operation of said operating means.

20. 7. A device as claimed in Claim 1, characterized in that said reel attitude detecting unit are of electronic type and comprise a first set of photocells arranged at a first position for signalling the reel arrival and a second set of photocells arranged spaced apart at a second position, connected to a signal

processing circuit for outputting a signal to be sent to the tilting unit.

8. A device as claimed in Claim 7, characterized in that the photocells of the first and second set comprise at least one
5. photocell for anyhow detecting the reel passage and at least another photocell for detecting the reel height, variable according to the tapering and sizes of the reel.

9. A device as claimed in Claim 7, characterized in that each of said first and second photocell set comprises at least
10. one enabling photocell.

10. A device as claimed in Claim 7, wherein said processing circuit comprises bistable type of logic elements.

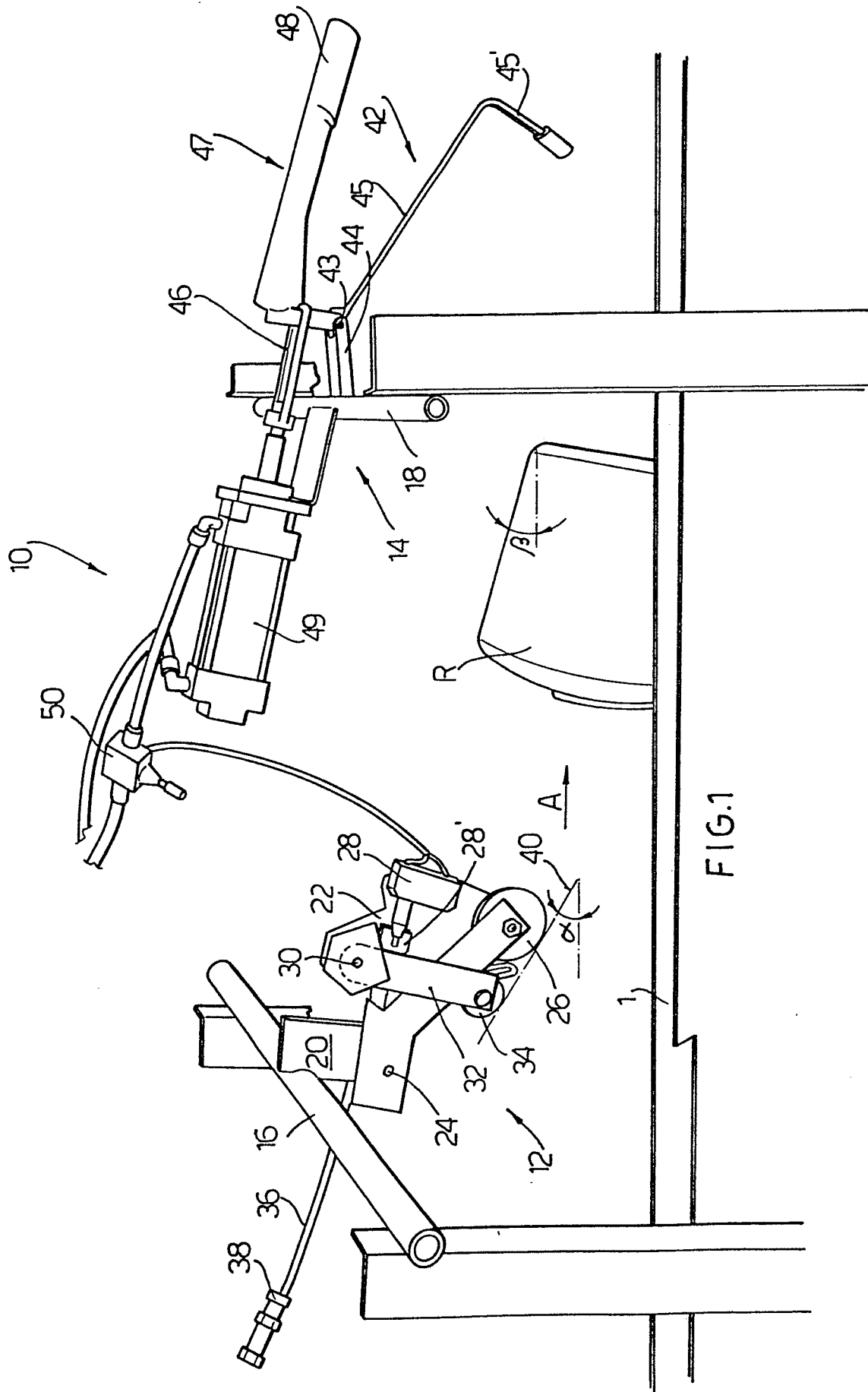


FIG. 1

FIG.2

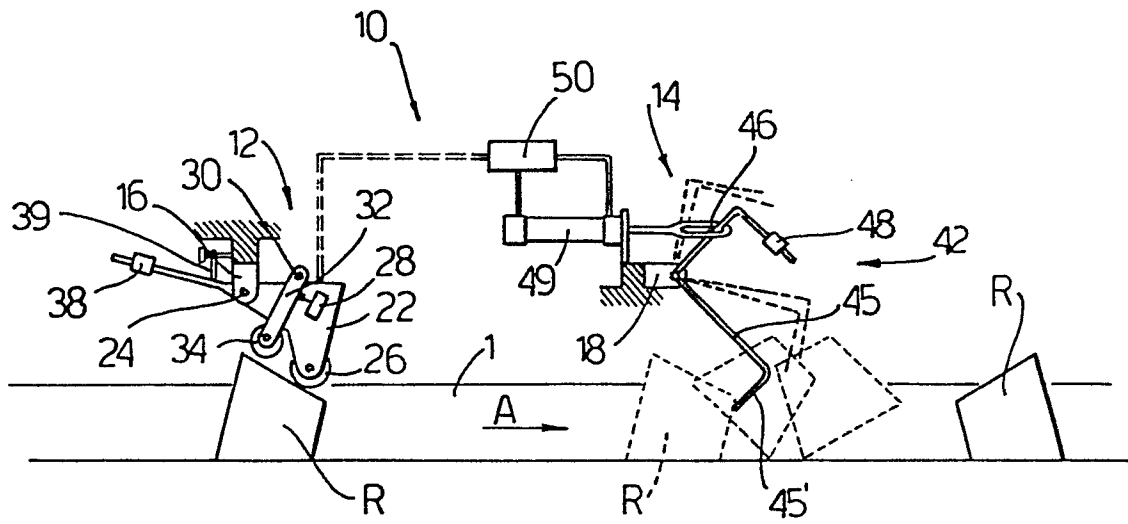


FIG.3

