United States Patent [19]

Tokuno

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[54] **DEVICE FOR SECURING SLITTER OR SCORER HEAD**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.**..... **93/58.2,** 83/504, 83/665, 83/425.4, 83/498

[51] **Int. Cl.**..... **B31b 1/20,** B23d 19/04, B26d 1/24

[58] **Field of Search** 83/498, 499, 504, 425.4, 83/665; 93/58.2

[56] **References Cited**

UNITED STATES PATENTS

2,491,976	12/1949	Hauser	83/665 X
3,302,506	2/1967	Turner et al.	83/665
3,422,714	1/1969	Van Gompel et al.	83/504 X

FOREIGN PATENTS OR APPLICATIONS

1,167,644	5/1957	Germany	83/665
1,256,055	7/1965	Germany	83/665

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Attorney, Agent, or Firm—Wenderoth, Lind & Ponack

[57] **ABSTRACT**

A device for securing a slitter or scorer head to a rotary shaft. The head is slidably mounted on the rotary shaft and a constriction means is provided between the head and shaft. The constriction means comprises a constriction element provided on the inner periphery of the head, and a flat support face provided on the outer periphery of the shaft along the longitudinal axis thereof. The constriction element is projected from the inner periphery of the head into an aperture formed by the flat support face and the inner periphery of the head. The aperture has a section like a segment of a circle and is adapted to be higher than the projection. The slight rotation of the head in respect to the shaft causes the constriction element to pressure-contact with or separate from the flat face of the rotary shaft, the head thereby being fixed or released from fixing.

4 Claims, 4 Drawing Figures

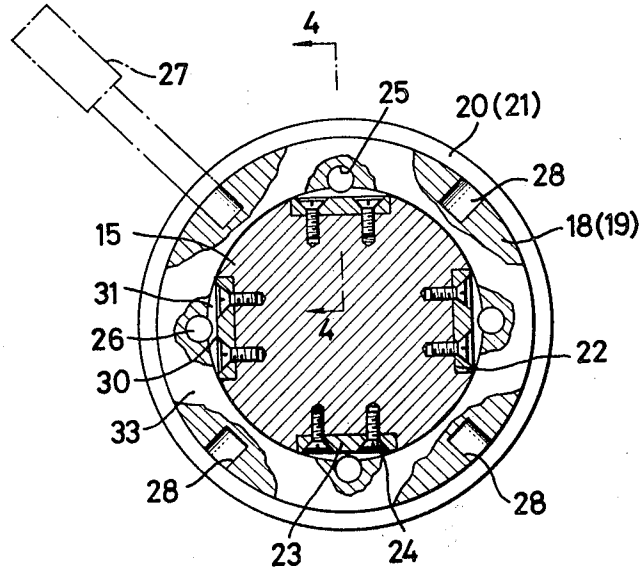

FIG.1

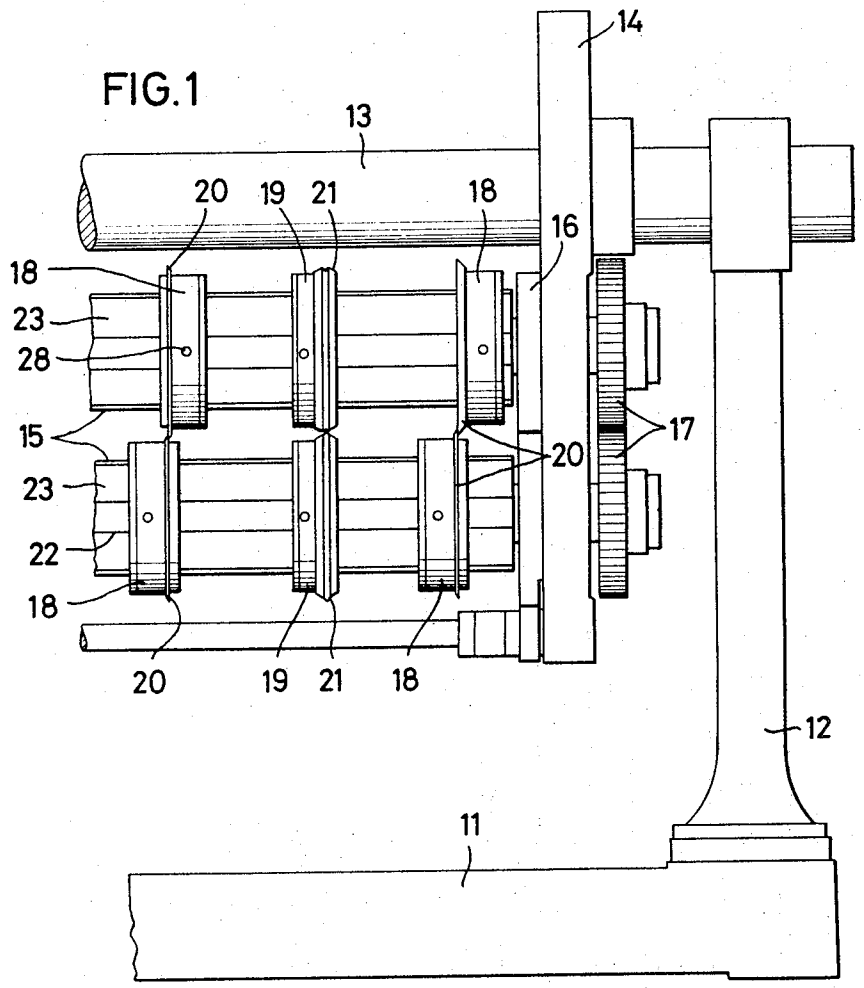
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FIG.4

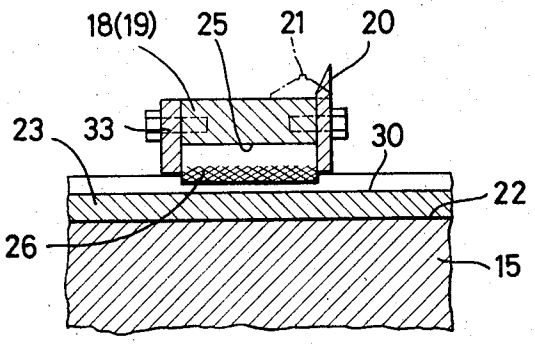
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FIG. 2

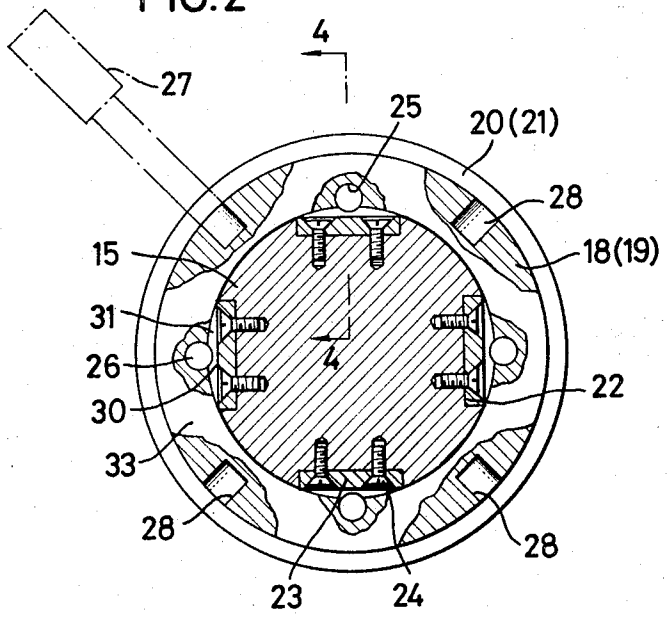
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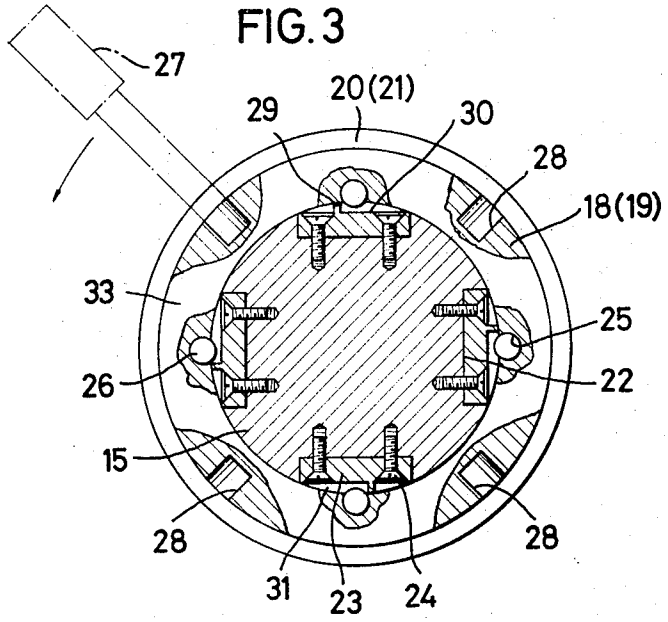
FIG. 3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DEVICE FOR SECURING SLITTER OR SCORER HEAD

The present invention relates to a device for securing a slitter head to a rotary shaft for cutting off edges of cardboard or a scorer head for forming folding creases or the like on cardboard during the process of producing cartons from corrugated or plain blanks.

Heretofore, for the adjustment of slitters or scorers in the finishing operation for producing corrugated blanks or other paper sheets, a great deal of time was required to complete the setting thereof. To be more precise, according to the conventional setting method, slitter or scorer heads had to be moved axially to required positions by hand after loosening a plurality of bolts which were securing said heads to a rotary shaft, and the heads were then reattached to the rotary shaft by constricting the bolts.

Consequently, the operation involved a great deal of time and trouble resulting in a reduction of operation efficiency of the apparatus.

An object of the present invention is to obviate such defect of the conventional apparatus as described above by making it possible to change the position of the heads and to easily secure them again without making use of bolts.

The device of the present invention comprises a slitter or scorer head mounted on a rotary shaft axially slidably therealong and rotatable in respect to the shaft within the range of a predetermined angle, and a constriction means provided between said shaft and head, said means enabling said head to constrict or release the rotary shaft by slightly rotating said head with respect to said shaft. When the head is released from constricting the rotary shaft by rotating it with respect thereto, the head is slidable therealong, and at the required position to fix the head, the head is again slightly rotated to constrict the rotary shaft to be secured to the shaft.

Preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings in which;

FIG. 1 is a front view of the main part of a slitter scorer incorporating a securing device according to the present invention, broken away in part,

FIG. 2 is an enlarged cross sectional view, partially broken, showing one embodiment of a securing device,

FIG. 3 is the same view as FIG. 2, showing another embodiment of a securing device, and

FIG. 4 is a side view, vertically sectioned along the line 4—4 in FIG. 2.

Referring now to FIG. 1, numeral 11 designates a base, a transverse shaft 13 being secured at each end thereof to the upper end of a support frame 12 erected on each end of said base 11. A pair of right and left side frames 14 are secured to the transverse shaft 13 (left one is not shown). A pair of upper and lower rotary shafts 15 are rotatably supported by bearings 16 on the side frames 14.

A gear 17 is secured to one end of each rotary shaft 15, the upper and lower rotary shafts 15 being adapted to rotate in reverse directions at the same speed by the engagement of the upper and lower gears 17. Said shafts 15 are rotated by a known driving means (not shown).

A slitter head 18 and a scorer head 19 are slidably mounted on the rotary shafts 15, said heads 18 and 19 being of an annular shape. A cutter 20 having an edge projecting around the slitter head 18 is secured to the head 18 and a ridge 21 is provided on the entire outer periphery of the scorer head 19 for forming creases on blanks passing between the upper and lower heads 19.

Wide grooves 22 are formed on the periphery of each shaft 15 along the longitudinal axis thereof throughout the length thereof, said grooves being spaced equally. A long plate 23 is fitted into each of the grooves 22, said plate being secured by screws 24 so that the heads of the screws do not project from the surface of said plate 23, as shown in FIG. 2. The surface of the plate 23 constitutes a flat support face 30, between said support face and the interior periphery of the head 18 being formed an aperture 31 having a section like a segment of a circle.

A plurality of grooves 25 each having an arc-shaped section are formed axially in the interior periphery of each head 18 at the positions corresponding to the support faces 30 of the plates 23. As is clear from FIG. 4, the groove 25 is extends from one side of the head 18 to the other side thereof along the inner periphery, a cylindrical roller 26 serving as a constriction element being rotatably fitted in each said groove 25, a smaller part of the outer periphery of the roller 26 projecting into the aperture 31. A support ring 33 and the cutter 20, secured to the head 18 with screws, retain the rollers 26 within the grooves 25. The roller 26 does not extend completely across the aperture 31 when centrally positioned with respect thereto.

A plurality of holes 28 are provided on the periphery of the head 18 for detachably inserting a handle 27.

In the above mentioned embodiment, when the roller 26 is separated from the support face 30 of the plate 23, as shown in FIG. 2, the head 18 is not constricting the rotary shaft 15, the head 18 in this state being manually slidable along the shaft 15. When the head 18 is slightly rotated in the right or left direction in FIG. 2, the roller is brought into pressure contact with the support face 30 of the plate 23, the head 18 being thereby secured to the rotary shaft 15 by constricting it.

In the securing device shown in FIG. 2, by rotating the head 18 in either direction about the periphery of the rotary shaft 15, the head 18 is brought into or released from the construction of the shaft 15.

In another embodiment, shown in FIG. 3, however, if the head 18 is rotated clockwise in respect to the rotary shaft 15, both members 15 and 18 are securely fixed to one another, and if the head 18 is rotated counterclockwise, the head 18 is released from construction to be slidable along the shaft 15. In this embodiment, a projection 29 is provided on the left side of the support face 30 of each plate 23 thereby preventing the roller 26 from moving leftward beyond the projection 29. All other parts and elements are similar to those in FIG. 2 and are shown by similar reference numerals.

In the embodiment shown in FIG. 3, it is required that the rotary shaft 15 is arranged to rotate counterclockwise. By this arrangement, the roller 26 provided on the head is brought into pressure contact with the support face 30 for harder constriction than otherwise achieved because of resistance acting on the face 30 during the counterclockwise rotation of the shaft 15.

The handle **27** is used for rotating and moving the head **18,** said handle being removed after securing the head **18** to the shaft **15** at a required position.

The scorer head **19** has a construction similar to that of the slitter head **18,** that is, similar mechanisms as those shown in FIGS. **2** and **3** are built in the scorer head **19.**

The head **19** is rotated in the loosening direction with respect to the rotary shaft **15** by the handle **27** thereby separating the roller **26** from the support face **30** of the plate **23,** the head **19** being secured to the rotary shaft **15** through the roller **26** by rotating the head in the constricting direction after said head has been moved to a required position.

Maintenance of the present device will be facilitated if the roller **26** is made of harder material than the plate **23** by tempering the roller **26** and if the plate is replaced regularly.

Moreover, if a non-skid means such as knurls is provided on the periphery of the roller **26,** fixing of the heads **18** and **19** to the rotary shaft **15** is further improved. As to the shape of the constriction element **26** too, forms other than the cylindrical one as shown in the drawings may also be employed.

What is claimed is:

1. A device for locking a slitter or scorer head on a rotary shaft whereby said slitter or scorer head may be readily positioned along the longitudinal axis of said rotary shaft at any desired location, said device comprising: said rotary shaft having a plurality of flat faces formed thereon along the longitudinal axis thereof; a plurality of rollers; the inner periphery of the slitter or scorer head having a plurality of bores formed therein at locations corresponding to each of the flat faces of the rotary shaft; one of said rollers mounted in each of said bores, said head positioned such that a portion of each roller projects into an aperture formed by the peripheral surface of said bore and the corresponding flat face of the rotary shaft, said aperture having sufficient depth such that said rollers are out of contact with the respective flat faces when centrally positioned relative thereto and contacting the respective flat faces when moved by rotation of said head, thereto; and the outer periphery of the head having a plurality of holes variously positioned about the periphery of said head for receiving therein a handle for rotating the head, whereby said head is locked by rotating it to a position where said rollers are positioned adjacent the edges of said flat faces, said head being unlocked by rotating said head to a position where said rollers are located centrally of said faces.

2. A device for locking a slitter or scorer head as claimed in claim **1,** wherein a ridge is provided on each of said flat faces of the rotary shaft and extending along the entire length of the flat face, whereby the roller is prevented from advancing beyond said ridge when the head is rotated in one direction.

3. A device for locking a slitter or scorer head as claimed in claim **1,** wherein a knurl is provided on the outer periphery of each of said rollers.

4. A device for locking a slitter or scorer head as claimed in claim **1,** wherein a flat plate is detachably mounted in each of a plurality longitudinal grooves provided in the outer periphery of the rotary shaft so as to form each of said flat faces.

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