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(54) **Expansion shaft**

(57) The expansion shaft, that comprises of a pipe with longitudinal ducts, with a body with pressure elements mounted in it, characterised in that in pipe (1) there is a body (2) with three cut-outs.

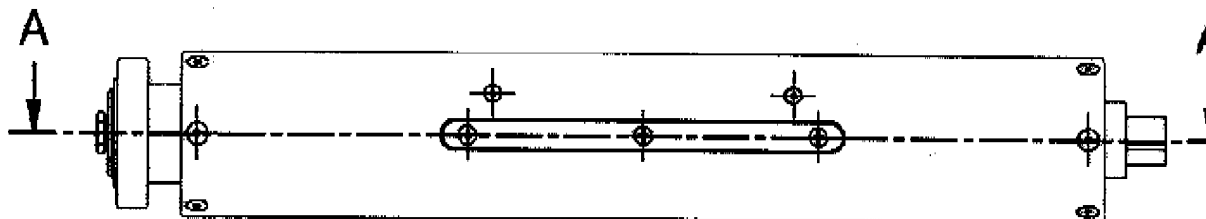


Fig. 1.

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Description

[0001] The subject of the invention is an expansion shaft designed especially for mounting the rolls in the winding and unwinding mechanisms for the low rigidity tapes.

[0002] Expansion shafts are used in many devices that process the tape shaped material. The main function of the shafts is a longitudinal and circumferential immobilization of the tape rolls.

[0003] The expansion shaft, that comprises of a cylinder shaped body that has a flange at one of its ends and a truncated cone on the other, is known from the Polish utility model 58574. There are longitudinal cut-outs on the surface of the cylinder, the jaws move in those cut-outs. The jaws are placed on the expansion inset mounted inside the body. The cone part of the cylinder is closed by a valve plug with an air valve. The flange part of the cylinder is closed by a rear plug with a cap.

[0004] The expansion shaft that comprises of a body, that ends with heads on both sides, is known from the description of the utility model 58898. There are jaw guides placed centrally inside the body. There are expansion insets placed on the guides, in the form of tubes, and there are jaws located on them. The jaws are located in the longitudinal cut-outs of the body. There is a pneumatic valve on the body, that is connected with tube connectors by an internal duct.

[0005] An expansion shaft with a pipe shaped body ended with heads on both sides, that has a expansion inset in the form of tube placed through the whole length of the body. The jaws placed in the longitudinal cut-outs of the body are located on the expansion inset. On one of its ends, the tube is mounted in the head by o-ring sealing rings placed between the cap and the inset, there is a duct connected with a pneumatic valve in the inset. On the other side, the tube is clamped between the cap and the inset by a contracting screw.

[0006] In the known solutions, it does happen that the pressure of the jaws that fix the cylinder to the tape is uneven, that is why the elements of one of the jaws wear out quicker. What is more, during inserting the cylinders into the inside of the beam, the known solutions may get blocked because their moving elements do not completely withdraw to their initial positions. It is therefore advisable to develop such an expansion shaft construction that allows to quickly replace the tape beam and does not block the shaft during fixing the beam on it. Those conditions are met by an expansion shaft according to the invention./

[0007] The expansion shaft according to the invention has a pipe with at least two ducts, inside of which there is a body with a number of cut-outs corresponding to the number of ducts. On each of the cut-outs, there are at least two pneumatic pressure actuators connected to each other by a pneumatic hose. On the pressure actuators, there are bars with pressure insets guided through the pipe ducts, as well as clevises on both ends. The

bars are joined together with tension springs hooked in clevises' holes. The pipe has two heads mounted on both ends. In one of the heads there is a pneumatic valve connected with the ducts by connectors and by elastic pneumatic hoses connected with relative sets of pressure actuators.

[0008] The subject of the invention is presented in the picture in which fig. 1 presents the shaft view, fig. 2 presents the shaft longitudinal section, fig. 3 presents the cross section B - B of the shaft, and fig. 4 cross section C - C of the shaft.

[0009] The expansion shaft according to the invention consist of a pipe 1 with three longitudinal ducts, in which there is a body 2 with three cut-outs mounted. In each of the cut-outs there are two pneumatic pressure actuators 7 connected with each other by a pneumatic hose 11. On the respective pairs of pressure actuators there are bars 3 with pressure insets 4 placed in the pipe ducts and two clevises 5 on both ends. The bars 3 are joined together with tension springs 6 hooked in clevises' holes. The pipe has two heads 7 and 8 mounted on both ends. In the head 8 there is a pneumatic valve 10 that feeds an air container 15 connected by connectors 12 and 13 and elastic hoses 17 with respective pressure actuators pairs 7.

Claims

1. The expansion shaft, that consists of a pipe with longitudinal ducts, with a body with pressure elements mounted in it, **characterised in that** in pipe (1) there is a body (2) with three cut-outs.
2. The shaft as per claim 1 **characterised in that** in each of the cut-outs there are two pneumatic pressure actuators (7) connected with each other by a pneumatic hose (11), and on the respective pairs of pressure actuators there are bars (3) with pressure insets (4) led in the pipe ducts and two clevises (5) on both ends.
3. The shaft as per claim 2 **characterised in that**, the bars (3) are joined together with tension springs (6) hooked in clevises' holes.
4. The shaft as per claim 1 or 2 or 3 **characterised in that**, the pipe has two heads (7 and 8) mounted on both ends.
5. The shaft as per claim 4 **characterised in that**, in the head (8) there is a pneumatic valve (10) that feeds the air container (15) connected by connectors (12 and 13) and elastic hoses (14) with respective pressure actuators pairs (7).

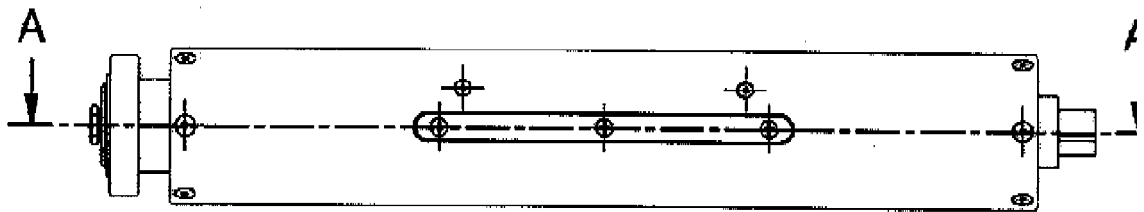


Fig. 1.

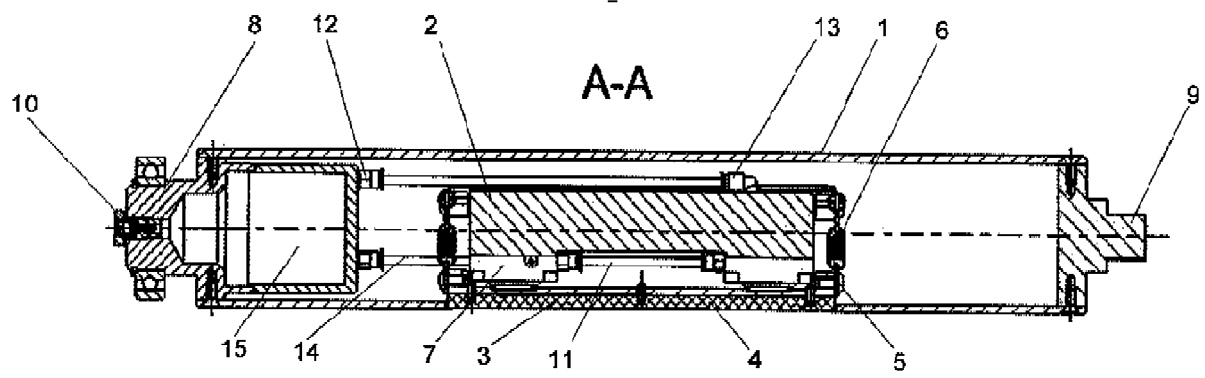


Fig. 2.

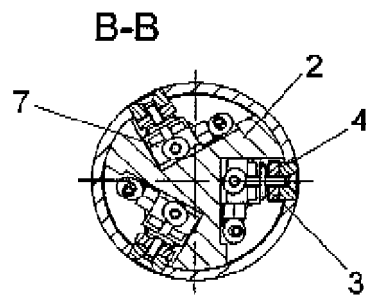


Fig. 3.

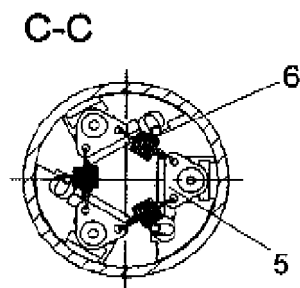


Fig. 4.



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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 February 2015	Examiner Lemmen, René
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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