May 19, 1970

M. S. NEIFELD ETAL

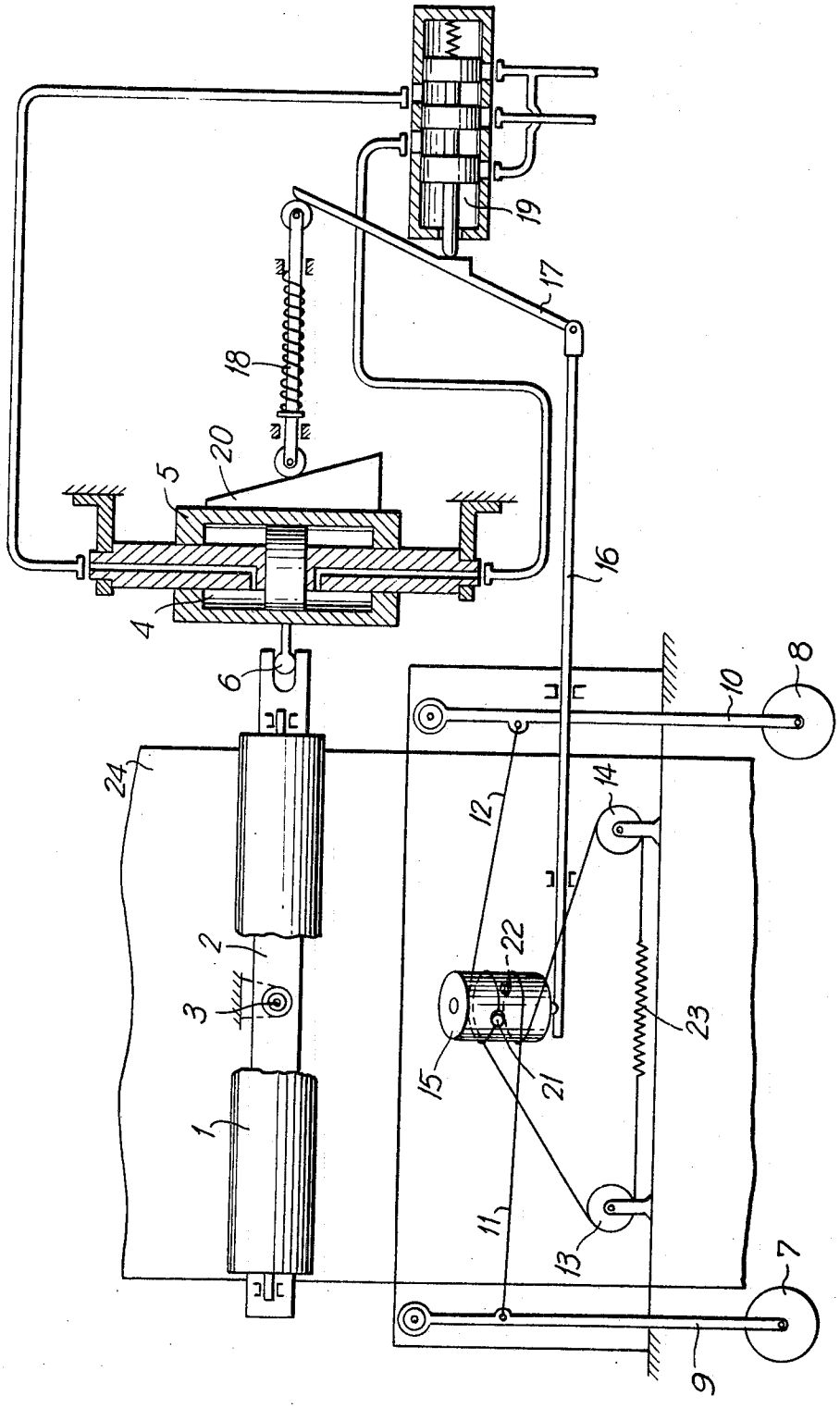
AUTOMATIC DEVICES FOR CENTERING THE MOVING PROCESSING CLOTH

3,512,691

Filed Dec. 7, 1967

3 Sheets-Sheet 1

FIG. 1



May 19, 1970 M. S. NEIFELD ETAL 3,512,691

AUTOMATIC DEVICES FOR CENTERING THE MOVING PROCESSING CLOTH

Filed Dec. 7, 1967 3 Sheets-Sheet 2

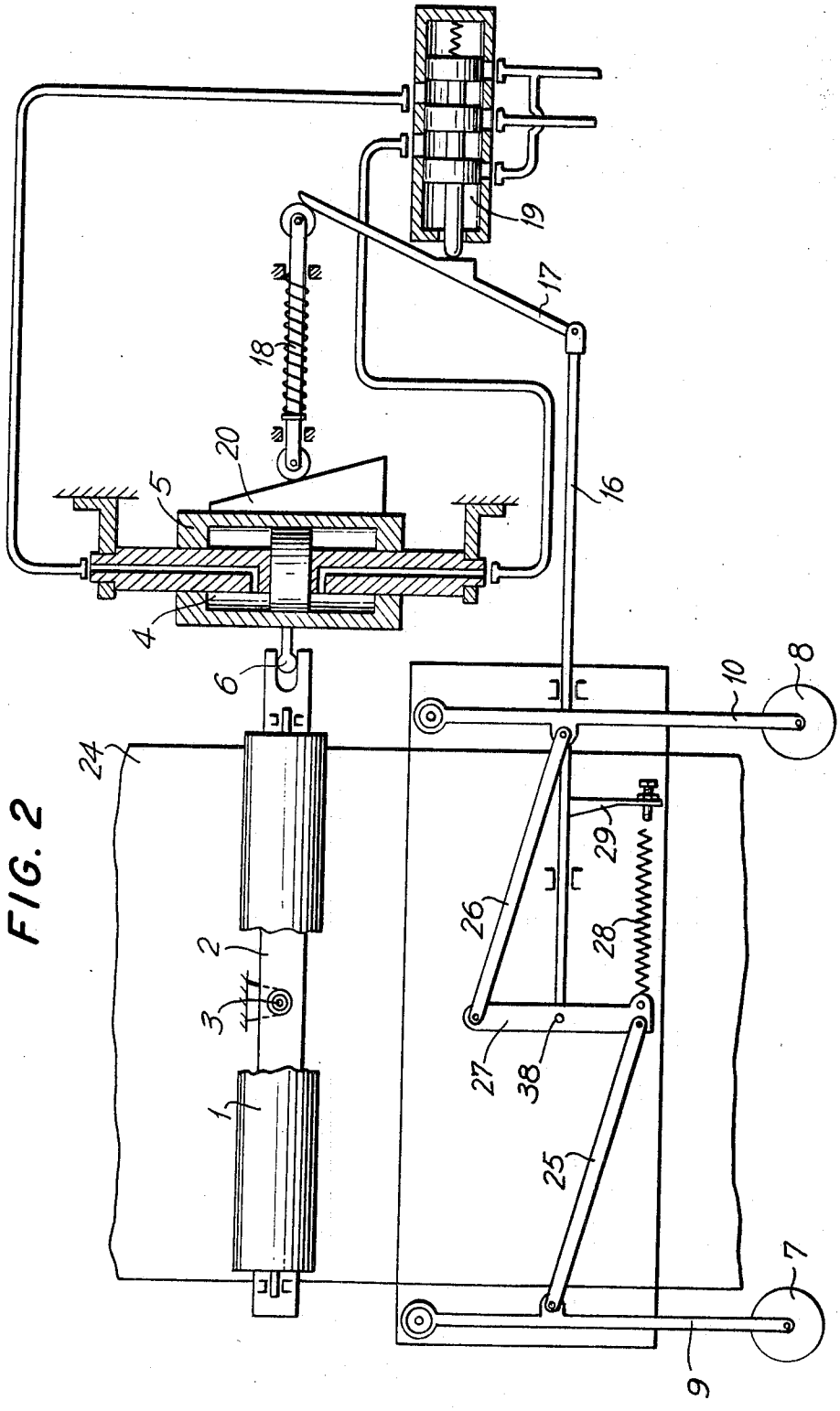


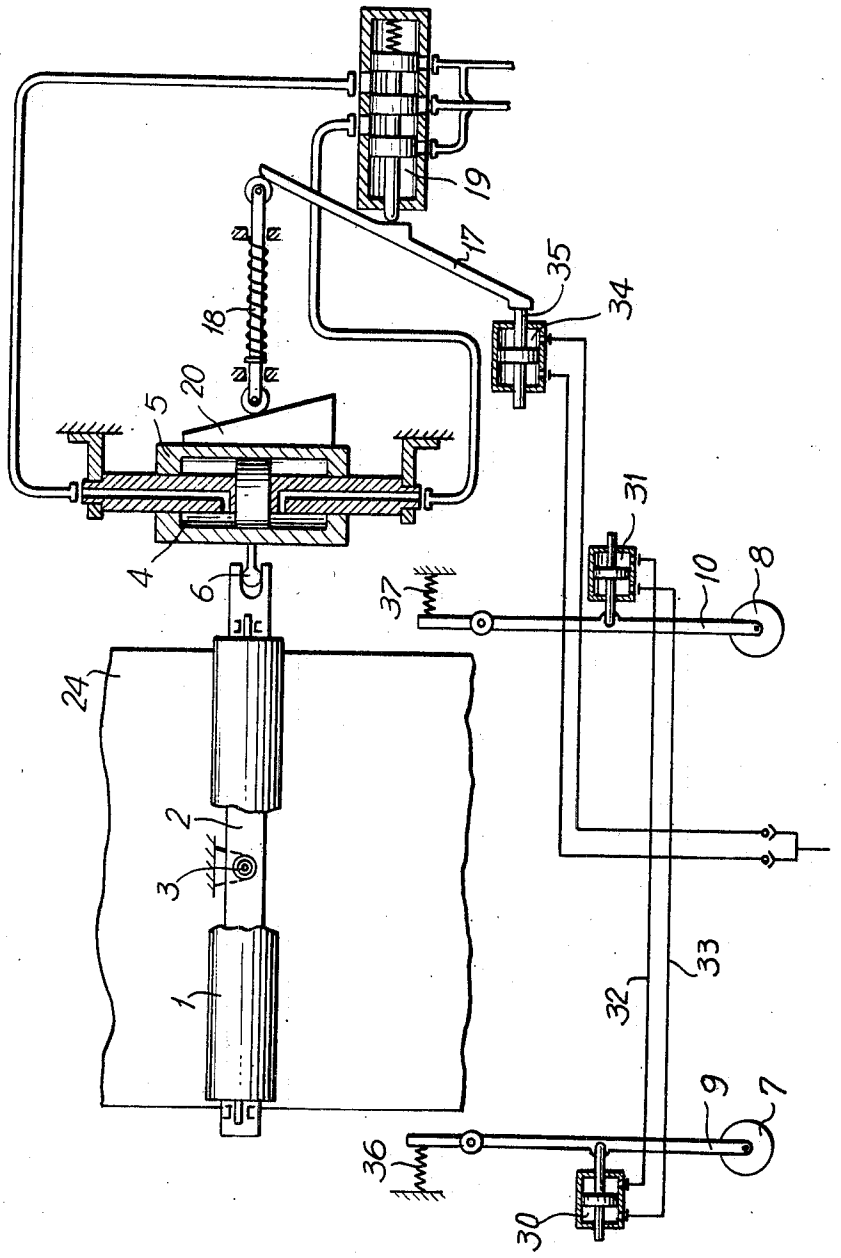
FIG. 2

May 19, 1970 M. S. NEIFELD ETAL 3,512,691

AUTOMATIC DEVICES FOR CENTERING THE MOVING PROCESSING CLOTH

Filed Dec. 7, 1967 3 Sheets-Sheet 3

FIG. 3



United States Patent Office 3,512,691
Patented May 19, 1970

3,512,691

AUTOMATIC DEVICES FOR CENTERING THE MOVING PROCESSING CLOTH

Mark Solomonovich Neifeld, Pavel Samuilovich Moroz, Leizer Zelikovich Nemenman, and Vladimir Sergeevich Ushakov, Moscow, U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Po Oborudovaniju dlya proizvodstva asbestotsementnykh Izdely I Rulonnokrovelnykh Materialov, Moscow, U.S.S.R.

Filed Dec. 7, 1967, Ser. No. 688,823
Int. Cl. B65h 25/06
U.S. Cl. 226—23 4 Claims

ABSTRACT OF THE DISCLOSURE

A moving processing cloth is centered by adjusting the angular position of an adjusting roll through the action of a movable barrel of a power cylinder. The barrel is moved by the operation of a slide valve distributor, the piston of which is actuated by a rocking shaft one end of which is connected to a spring-loaded follower bar engaging a cam on the barrel and the other end of which is connected to a displaceable rod which in turn is connected through a rope, lever, or hydraulic mechanism to a pair of spring loaded pivotal levers carrying rollers engaging the edges of the moving cloth.

The invention relates to automatic devices for centering moving processing cloth, in particular in sheet-forming machines intended for fibre-cement, paper- and cardboard-making industries.

The conventional automatic devices for centering the moving processing cloth in said machines are provided with an adjusting roll driven by a hydraulic cylinder receiving the command signals from feelers rigidly secured on a common movable axle or independent of one another.

A disadvantage common to all conventional devices is that they fail to center the cloth when its width is varied in operation.

This especially refers to smooth woolen cloth.

An object of the invention is to eliminate the above disadvantage.

The object is achieved by providing a device with two operatively interconnected spring-loaded levers carrying feelers at their ends, a rod of an operative interconnection mechanism of the levers being joined to one end of a rocking shaft contacting the piston of a slide valve distributor for the power cylinder of the adjusting roll, whereas the other end of the rocking shaft is joined to the spring-loaded bar interacting with the cam secured on the movable barrel of the power cylinder which is articulated to the adjusting roll.

One mode of the operative interconnection of between the levers is a rope arrangement, wherein the ropes attached to the levers are reeved around a drum mounted on the rod of the operative interconnection mechanism for the levers.

Such operative connection between the levers can be also carried out by means of bars articulated the levers and to the arms of a double-arm lever connected to the rod of said operative interconnection mechanism for the levers.

In the case of operating with very wide cloth pieces, said operative interconnection mechanism comprises auxiliary power cylinders articulated to the levers, whose inner chambers intercommunicate via pipe-lines which, in turn, communicate with the spaces of one further power cylinder whose rod serves as the rod of said operative interconnection of the levers.

Such an embodiment of the drive ensures a reliable

centering of the processing cloth with respect to the longitudinal axis of the machine even when a variation in the width of cloth occurs during operation.

The first two modes of the operative interconnection mechanism between the levers are used for rather narrow cloth pieces, i.e., with a width of up to 2500 mm., the third mode being suitable for wider cloth pieces.

Given hereafter is a detailed description of specific and preferred embodiments of the invention with reference to the appended drawings, wherein:

FIG. 1 is a diagrammatic illustration of a device made according to the invention, wherein the operative interconnection between the levers is made as a rope arrangement;

FIG. 2 shows the same device wherein the operative interconnection between the levers is constructed as a leverage;

FIG. 3 shows the same device, wherein the operative interconnection between the levers is constructed as a hydraulic system.

The device for centering the processing cloth comprises an adjusting roll **1** (FIGS. 1, 2 and 3) mounted on a platform **2** the middle portion of which is secured on the bed (not shown in the drawing) by means of a hinge joint **3**. The roll **1** is turned by a power cylinder which is a hydraulic cylinder in this particular case, said hydraulic cylinder **4** being also mounted on the bed and having a moving barrel **5** connected to the platform **2** by means of a carrier **6**. Roll feelers **7** and **8** are mounted at the ends of levers **9** and **10** respectively, the other end of said levers being articulated to the bed.

The operative interconnection between the levers **9** and **10** is made by ropes **11** and **12** (FIG. 1) reeved around the pulleys **13** and **14** and drum **15**.

The latter is articulated to a rod **16** which, in turn, is hinged-joined to the end of a rocking shaft **17**.

The latter with its other end is joined to a spring-loaded bar **18**. The rocking shaft **17** rests upon the piston of a slide valve distributor **19**. The spring-loaded bar **18** interacts with a cam **20** secured on the moving body **5** of the drive hydraulic cylinder **4**.

Each rope **11** and **12** is reeved around drum **15** in a single-turn loop. The midpoint of each loop is locked on the drum by screws **21** and **22**. The ropes **11** and **12** are interconnected by a spring **23** which presses the roll feelers **7** and **8** against a cloth **24**.

The levers **9** and **10** can be interconnected by means of intermediate bars **25** and **26** (FIG. 2) articulated to the arms of a double-arm lever **27** which is articulated to the rod **16** of the operative interconnection between the levers **9** and **10**.

A spring **28** which presses the roller feelers **7** and **8** against the cloth **24** connects the end of the double-arm lever **27** with a strip **29** rigidly attached to the rod **16**.

For operation with cloth pieces wider than 2.5 m., a hydraulic system is used for the operative interconnection between the levers **9** and **10**. In this case additional hydraulic cylinders **30** and **31** (FIG. 3) are articulated to said levers, the chambers of said cylinders being interconnected via pipe lines **32** and **33** which in turn are connected with the chambers of one further hydraulic cylinder **34**. A rod **35** of said hydraulic cylinder serves as the rod of the operative interconnection between the levers **9** and **10**. Springs **36** and **37** which individually press each roller feeler **7** and **8** against the cloth **24** connect the ends of the levers **9** and **10** respectively with the bed.

While in operation, the springs **23**, **28**, **36** and **37** (FIGS. 1, 2 and 3) continuously press the roller feelers **7** and **8** against the edges of the cloth **24**. If the cloth width is varied in operation but the cloth itself is not displaced relative to the longitudinal axis of the machine, the posi-

tion of the adjusting roll **1** remains constant since the levers **9** and **10** move in opposite directions at the same angle. If the operative interconnection between the levers is accomplished according to the first aforementioned mode, the drum **15** (FIG. 1) will turn about its axis without actuating the rod. The drum will turn under the effect of tension of the spring **23** via the ropes **11** and **12** when the roller feelers **7** and **8** move to meet each other and by the levers **9** and **10** when said roller feelers move apart from each other.

If the operative interconnection between the levers is accomplished according to the second of the above said modes, similar displacement of the levers **9** and **10** (FIG. 2) causes a displacement of the intermediate bars **25** and **26** while the double-arm lever **27** turns about a pivot **38** without actuating the rod **16**. In this case the spring **28** performs the same functions as the spring **23** in the first mode of the operative interconnection of the levers.

If the operative interconnection between the levers is accomplished according to the third of the modes mentioned above, said displacement of the levers causes the oil in the hydraulic system to flow between the chambers of the both hydraulic cylinders **30** and **31** (FIG. 3) along the pipe lines **32** and **33** thus by-passing the hydraulic cylinder **34** without actuating the rod of the operative interconnection system **35**.

When the cloth **24** is displaced relative to the longitudinal axis of the machine to either side, the roller feelers **7** and **8** travel in the same direction as the cloth. In this case, if the operative interconnection system is accomplished according to the first mode, the rod **16** will be displaced in the direction of the lever displacement, but the drum **15** will not turn about its axis.

While travelling, the rod **16** actuates, through the rocking shaft **17**, the slide valve distributor **19** which lets the oil flow through one of the holes in the stationary piston of the hydraulic cylinder **4** to enter its moving barrel **5**.

When the barrel **5** of the hydraulic cylinder **4** moves together with the cam **20**, the carrier **6** turns the platform **2** and, together therewith, the adjusting roll **1**, in either direction, whereby the cloth **24** is made to return to the central position.

In this case the spring-loaded bar **18** while interacting with the cam **20**, shuts off the slide valve of the distributor **19**, whereby the oil feed to the hydraulic cylinder **4** ceases. Thus, the degree to which the adjusting roll **1** is inclined in an exact agreement with a certain amount of cloth displacement to either side.

If the operative interconnection is accomplished according to the second mode, both intermediate bars **25** and **26** and the double-arm lever **27** with the rod **16** move in the same direction but the double-arm lever does not turn about its axis **38**. While moving the rod **16** actuates the rocking shaft **17** and therethrough the entire hydraulic

system and the adjusting roll **1** in the above-described way.

If the operative interconnection is accomplished according to the third mode, the oil flows from the space of the hydraulic cylinders **30** and **31** to the corresponding space of the hydraulic cylinder **34** thus causing its rod **35** to move and actuate, through the rocking shaft **17**, the slide valve distributor **19**, hydraulic cylinder **4** and adjusting roll **1** in the above-described way.

What we claim is:

1. An automatic device for centering moving processing cloth in a forming machine, said device comprising an adjusting roll adjustably mounted on a bed; a power cylinder also mounted on the bed and including a movable barrel which is coupled to said adjusting roll to adjust the position thereof; two displaceable spring-loaded levers; roller feelers located on said levers for engaging lateral edges of the moving cloth; means interconnecting said levers and including a rod which is displaced in accordance with movement of said levers caused by shifting of the edges of the cloth; a rocking shaft connected with said rod for following the displacement thereof; a slide valve distributor having a piston in contact with said rocking shaft for being operated thereby to activate the power cylinder; a spring-loaded bar operatively coupled with said rocking shaft; and a cam mounted on the movable barrel of the power cylinder and engaging said spring-loaded bar to operate the rocking shaft and thereby the distributor in accordance with change in position of the movable barrel.

2. A device as claimed in claim **1** wherein said means interconnecting said levers comprises a drum and pulleys, and ropes reeved around the pulleys and drum, said drum being secured to said rod.

3. A device as claimed in claim **1** wherein said means interconnecting said levers comprises bars articulated to said spring-loaded levers and a double arm lever connected to said bars and to said rod to operatively couple the latter.

4. A device as claimed in claim **1** wherein said means interconnecting said levers comprises a power cylinder articulated to each spring-loaded lever, and a further power cylinder having a rod constituted as said rod interconnecting said levers to actuate the same, said power cylinders which are coupled to the spring-loaded levers having intercommunicating chambers which, in turn, communicate with the chambers of said further power cylinder.

References Cited

UNITED STATES PATENTS

3,119,535	1/1964	Hoffman	226—23
3,368,665	2/1968	Jinkins	226—23 X

ALLEN N. KNOWLES, Primary Examiner