United States Patent

[11] **3,565,003**

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[21] Appl. No. **708,204**
[22] Filed **Feb. 26, 1968**
[45] Patented **Feb. 23, 1971**
[32] Priority **Feb. 14, 1968**
[33] **Austria**
[31] **A2239/67**

[54] **MOUNTING MEANS FOR CYLINDRICAL SCREEN ASSEMBLIES WITH COUNTERBALANCING MEANS**
4 Claims, 1 Drawing Fig.

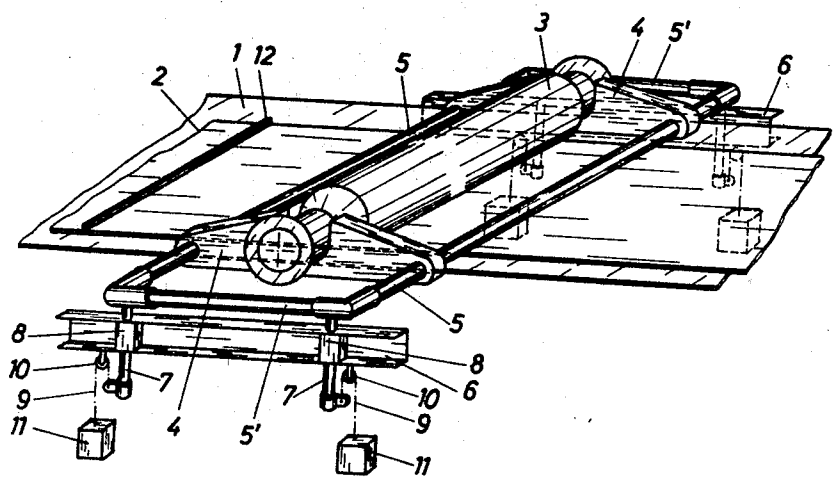
[52] **U.S. Cl.** **101/116,** 101/5, 101/269
[51] **Int. Cl.** **B41f 13/00,** B41f 3/46
[50] **Field of Search** 101/116, 115, 117, 118, 119, 120, 250, 252, 260, 269, 286, 5

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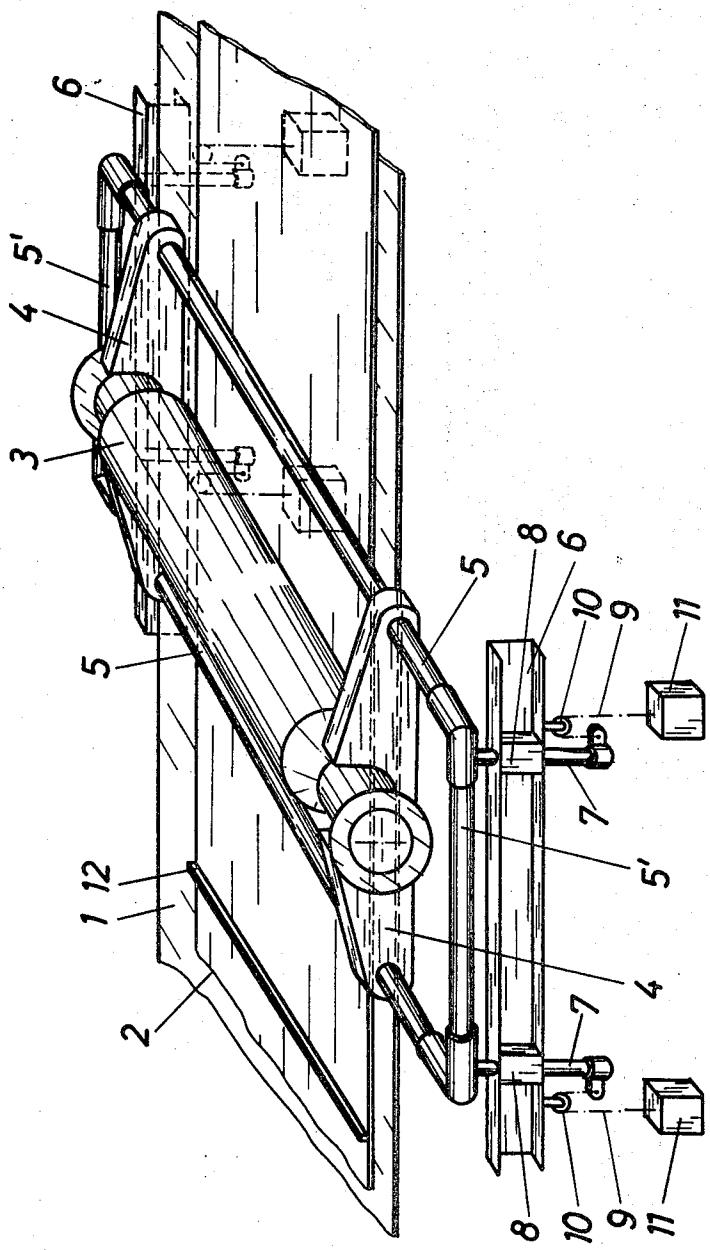
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ABSTRACT: A device for mounting cylindrical screens in a rotary screen-printing machine. The cylindrical screen and its mounting device is movably arranged on the machine for movement transversely to the printing blanket defined thrust plane and has weights for counterbalancing the device.



PATENTED FEB 2 3 1971

3,565,003



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MOUNTING MEANS FOR CYLINDRICAL SCREEN ASSEMBLIES WITH COUNTERBALANCING MEANS

This invention relates to a device for receiving cylindrical screens in a rotary screen-printing machine.

In rotary screen-printing machines in operation, the screen cylinders are pressed against the material transported by the printing blanket, for example by a doctor roller provided inside the screens which is attracted by a magnet bar arranged below the printing blanket. The material to be printed running through the machine often shows inequalities. In the case of textile material in particular, there are often seams running transversely to the longitudinal direction and guide motion of the material. In the case of thick textile material, the thickness of the material often varies. In order to avoid deformations and damages of the screen cylinders caused by the varying thickness of the material, the screen must be allowed to move upwardly or the material together with the printing blanket to move downwardly. If the screen is to move upwardly —which would be the case when there is a firm support under the printing blanket —there are shortcomings in that considerable forces oppose the lifting effect due to inequalities of the weight of the screen and of the mountings thereof.

It is an object of the present invention to avoid these shortcomings, which is attained by providing that the cylindrical screen —together with the machine parts pertinent to the mounting thereof —is movably mounted transversely to the thrust plane defined by the printing blanket under counter weight balance.

The counter weight balance, for example by means of discharge or weight-compensating means such as weights, springs, magnets, etc., compensates the total weight of the aggregate to be lifted (or at least the major part of the weight), whereby the required contact pressure between the screen and the support has to be maintained. When the screen assembly is lifted during a printing operation due to an inequality in the material, the mere functional contact pressure between the screen and the support is to be overcome in the most favorable case, when the total weight of the screen assembly is exactly compensated for or offset by the weight balance. In the case of rotary screen printing machines according to the magnet-doctor roller system in particular, this contact pressure is relatively low.

An embodiment of the invention is hereinafter described with reference to the accompanying drawing without being limited to it. The drawing is a schematic perspective view of one of usually several screen assemblies of a rotary screen-printing machine, whose major components are shown only fragmentarily and/or schematically.

The drawing shows part of the printing blanket **1** which moves in the longitudinal direction of the machine in operation and serves as a support and transport means for the material **2** to be printed. Above the printing blanket, usually on several points of the machine cylindrical screens **3** lying transversely to the longitudinal length and travel of the printing blanket **1** and touching the material **2**. In the zone of its two front sides the cylindrical screen **3** is held in screen holders **4**, for example by axial spanning, or axial adjustment of the holders and thus a longitudinal tension of the screen cylinder is obtained. The screen holders **4** are slidably mounted for said axial spanning on a pair of tubular carriers or carrier bars **5** which are combined to a frame by transverse pieces **5'**. This frame is movably mounted in vertical direction, on the longitudinal machine frame members or carriers **6** on both sides of the machine frame and transversely to the thrust plane, by means of pins **7** provided generally in the corners of the frame which are arranged in apertured or other suitable guides **8** on the longitudinal carriers **6**. On the bottom end of each pin **7** a chain **9** is mounted. The chains **9** are led over a guide roller **10** provided on each longitudinal carrier **6** and

each carry a discharge or counterbalance weight **11** on their ends. The discharge weights **11** quite together are adapted to exactly compensate or counteract the total weight of the screen assembly consisting of the cylindrical screen **3**, the screen holders **4**, the frames **5**, **5'** and the pins **7**.

If an inequality of the material, for example a seam **12**, arrives below the cylindrical screen **3**, the whole screen assembly which is compensated in the manner described, is easily lifted. Thus the seam **12** passes effortlessly under the cylindrical screen **3** without deforming or damaging the material.

Among the various other possibilities, a cable can be used instead of the chain **9** and tension springs provided at the end of the chain **9** or pressure springs pressing against the pins **7** from below can be used instead of weights **11** for the weight balance.

I claim:

1. In a rotary screen-printing machine having a machine frame and a printing blanket defining a printing thrust plane and traveling in a longitudinal direction of travel to support the material to be printed, improved means for mounting the rotary cylindrical screen assemblies in a counterbalanced manner, including

a. a rotary screen support-frame disposed to support a rotary cylindrical screen of a screen assembly with the axis transversely normal to the machine frame and to the longitudinal travel direction of the blanket;

b. a rotary screen assembly mounted on said screen support-frame which assembly comprises:

1. a rotary printing screen; 2. screen holders mounted on said frame with means for rotatably supporting said screen;

3. means cooperable with said machine frame adaptable to permit movement of said rotary screen assembly transversely to said thrust plane; and

c. counterbalancing means operatively connecting said screen assembly and said machine frame for counterbalancing the weight thereof, said counterbalancing means including:

1. complemental coacting means on said screen-supported frame and on said machine frame to facilitate relative movement of said screen and its frame toward and away from said thrust plane;

2. guide rollers provided on said machine frame at opposite sides adjacent the complemental means on said machine frame; and

3. cables, loaded with compensating weights at one cable end, being slidably guided over said machine-frame supported rollers to be acted upon by gravity and having the other respective cable ends connected to said screen assembly which by its mounting means tends to normally gravitationally move toward the thrust plane, and is counterbalanced by said weights of the counterbalancing means.

2. Means according to claim **1** wherein said screen-support frame includes a pair of spaced carrier bars disposed in parallel to the screen longitudinal axis and means mounting said pair of carrier bars movably on said machine frame transversely to said thrust plane under the action of said balancing means, and said screen holders having end portions for mounting on said bars.

3. Means according to claim **2** wherein said screen-support frame includes means connecting end portions of said spaced pair of carrier bars to form an assembly frame.

4. Means according to claim **3** wherein said screen support frame as of a rectangular form having corners each with a depending pin generally adjacent thereto depending toward the thrust plane, which pins are adapted to cooperate with aperture bearing means on said machine frame to facilitate said vertical movement of the screen and screen-support frame.