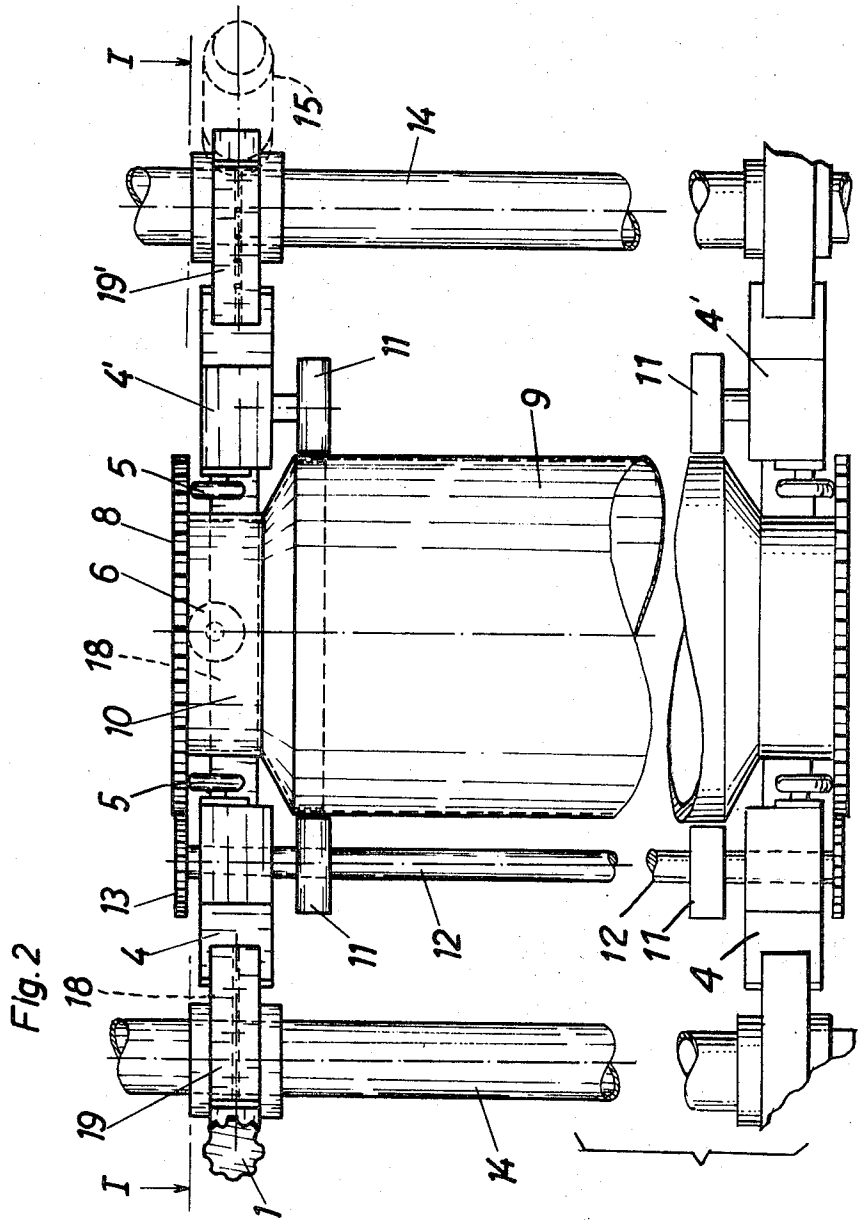


Fig. 1

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SCREEN HOLDER FOR ROTARY SCREEN PRINTING MACHINES

This invention relates to a screen holder for rotary screen printing machines adjustable to various screen diameters. A screen holder is meant to be that part of the machine in which the cylindrical screen of a rotary screen printing machine is rotatably held, the screen AC axis having a specific position transversally relative to the longitudinal disposition of the frame of the machine. In a certain sense a screen holder is similar to a bearing, but it need not necessarily show all specific features of a bearing.

Rotary screen printing machines are especially required to work with cylindrical screens of various diameters for adjustment to various repeat lengths. Rather complicated devices having many disadvantages in operating have been hitherto used, or devices have been known that utilizable merely for cylindrical screens which are given the longitudinal tension required by a stretching device arranged inside the cylindrical screen, but not for cylindrical screens having a stretching device acting from outside, i.e. from the frame of the machine to the cylindrical screens.

According to the invention there is evolved an improved precisely adjustable screen holder, favorable in operating which is also adapted for use with stretching cylindrical screens from the outside and can be adjusted to various screen diameters. This holder is obtained by providing at least one pair of oblique guideways diverging from the bottom outwardly toward the top having at least one slide member adjustable along these guideways on which the machine elements to be adjusted in accordance with the given screen diameter are arranged.

The machine elements arranged on the slide are particular supporting devices for the longitudinal support or longitudinal tension of the cylindrical screen, and for example, may comprise guide rollers for guiding the cylindrical screen slantwise or obliquely in relation to the longitudinal direction or for centering the cylindrical screen. As the case may be at least one of the slides can also serve as a bearing for a shaft over which rotary drive motion to the two front sides of the cylindrical screen is transmitted. An embodiment of the invention is hereinafter described with reference to the accompanying drawings without being limited to it.

FIG. 1 is a view taken substantially on line 1-1 of FIG. 2, of a screen front or end side, and FIG. 2 is a top plan view of an adjustable screen holder showing only one of the two front or end sides of a cylindrical screen. The screen support of the opposite front or end side of the cylindrical screen is understood to be the same or analogous.

On a frame adapted to be connected with the unknown supporting machine, which frame comprises parallel members or tubes 14 running transversely over the unshown machine or the fragmentally shown printing blanket 17, and which tubes 14 are generally parallel with the longitudinal direction of the screen are represented, there is mounted the base body means 18 of the screen holder. The two oblique guideways 19, 19' diverging from the bottom outwardly toward the top are arranged on the base body means 18 and the slides 4, 4' are adjustable on said guideways 19, 19' by means of threaded spindles 2, 2' which are in mesh with the slides 4, 4' by a nut thread element. The threaded spindles 2, 2' can be driven by a hand wheel 1 or by a motor 15. In order to simultaneously adjust both sledges 4 and 4' by one drive, the two threaded spindles 2, 2' are connected with knuckle joints 3 over a shaft 3. It is convenient for adjusting or driving the slide by means of the motor 15 to arrange a switch 15' for influencing the motor circuit on one of the slides, said switch being actuated by contact cams 16 on the guideway 19' for example in such a manner that the motor 15 after being initially switched on subsequently, when the switch 15' arrives to the next contact cam 16; thus the two slides 4, 4' cover a predetermined distance which is necessary for changing the adjustment of the screen holder from one usual screen diameter to the next one. When the motor is actuated, the slides of the screen holder can be simultaneously adjusted for all or part of the screens or the

motor 15 can be a synchronous motor which runs in synchronism with a conventional (unshown) transmitting machine. The transmitting machine supplies the synchronous motors of all screen holders in such a manner that all the synchronous motors run in synchronism with the transmitting machine. In order to control the adjustment of all the screen holders, merely the control of the transmitting machine is necessary, for example by means of a limit switch which is adjustable on a marked ruler in accordance with the screen circumference to be adjusted, with the transmitting machine moving a slide in parallel with the said ruler until it actuates the limit switch and thus terminates the common adjustment of all screen holders.

The two slides 4 and 4' carry the supporting devices which are, for example, rollers 5 which are supported to engage with the inner front surface of the gear wheel 8 connected with the screen via the screen head or end support means 10 and thus serve for effecting the longitudinal support or longitudinal tension of the cylindrical screen 9 together with the roller 6 arranged on the base body 18. Furthermore, the guide rollers 11 for guiding opposite sides of the cylindrical screen 9 are rotatable mounted on the slides 4 and 4' for oblique adjustment therewith in relation to their longitudinal axis. For example, the shaft 12 in the case of the slide 4 supports roller 11 and also a suitable spur or bevel gear 13 which is in mesh with the gear wheel 8. By means of the shaft 12, the gear 13 and a similar gear on the other opposite screen end (not shown), rotary motion of the screen is applied to both ends. Furthermore, the cylindrical screen 9 rests on the printing blanket 17 or on the material to be printed as transported by the printing blanket 17 and is helped to be put into rotation by the moving printing blanket or the moving material. Additionally, the gear wheel 8 of the cylindrical screen 9 is in mesh with a gear wheel 7 comprising part of a repeat transmission arranged on the machine and a synchronous drive.

When the screens in the machine are to be exchanged by screens of various diameter, merely an adjustment of the slides 4 and 4' along the guideways 19 and 19' is necessary.

Thus the machine elements of the screen holder to be adjusted for a given size screen diameter, which elements in the represented embodiment are primarily the rollers 5, the guide rollers 6 and the rollers 11, shaft 12 with the gear 13, can be adjusted automatically and simultaneously in exact relation to the screen diameter changes.

The inclinations of the guideways can be selected according to the desired angular distribution of the support and guide elements along the screen circumference. In the represented embodiment the support and guide elements are always to be in the horizontal median plane of the cylindrical screen, thereby requiring an inclination of 45° of the guideways.

A screen holder can also have guideways of various inclinations. Thus, in addition to a pair of diverging guideways, and an additional, differently inclined guideway and/or an additional pair of differently inclined guideways can be provided. In such case the represented embodiment ought to be altered: for example, the support roller 5, the guide rollers 6 and the shaft 12 with the bevel gear 13 ought to be arranged at different places.

These and other modifications may be made by those skilled in the art without departing from the inventive spirit and scope of the appended claims.

I claim:

1. Adjustable screen holder means for helping to hold, guide and tension interchangeable cylindrical rotary screens of various diameters and lengths for operable use in conjunction with rotary screen printing machines, which machines conventionally comprise a machine frame with means for supporting and means for driving an endless printing blanket for supporting the material to be printed upon, as well as for at least partially supporting the rotary screens in a manner with the screen axis disposed normally transverse to the longitudinal travel direction of the endless blanket and machine frame, said machines further including cooperable means thereon

and on at least one end portion of the rotary screens for rotatively driving same; said adjustable screen holder means comprising in combination:

- a. a pair of spaced support members on said frame sufficiently longitudinally spaced apart to receive therebetween any of the given size screens;
- b. inclined guideway means, including a pair of guideways, each having lower and upper portions and diverging from their lower to upper portions, and each of which includes means for mounting them respectively on said support members generally in association with at least one end portion of the given screen to help guidingly support and tension said screen;
- c. slide means including a pair of slides (4,4') and means for adjustably mounting one on each of said inclined guideways for movement toward and away from a given screen to be guided and supported therebetween; and
- d. screen-adjusting elements (5,11) mounted on said slides for operative engagement with said rotary screen.

2. Screen holder means as defined in claim 1 wherein said screen-adjusting elements of paragraph (d) are comprised of:

- 1. supplemental longitudinal support and guide means (11,11) for engagement with the periphery at opposite sides of said rotary cylindrical screen; and
- 2. supplemental longitudinal tension means (5,5) for operative tensioning of said screen at opposed sides thereof via

engagement with said cooperable means on the end portion of said rotary screens.

3. Screen holder means as defined in claim 1 wherein said screen-adjusting elements comprise guide elements (11,11) adjustable obliquely with said slides for guiding a cylindrical screen obliquely in relation to its longitudinal direction.

4. Screen holder means as defined in claim 1 wherein said slides are provided with aperture means and constitute bearings for a shaft (12) parallel to the axis of the screen, and means on said shaft cooperable with means on both end portions of said screens for transmitting drive rotation from one end to the other end.

5. Screen holder means as defined in claim 1 wherein the adjustment means of said slides on said guideways comprises a pair of threaded spindles each cooperating with threads on each of said slides.

6. Screen holder means as defined in claim 5 further including means (3') for coupling said threaded spindles for synchronous motion.

7. Screen holder means as defined in claim 5 including electric motor means (15) cooperably connected with and to drive one of said spindles and an electric switch (15') mounted on the slide associated with said spindle for controlling said motor by means of contact elements spaced at predetermined points along the corresponding associated guideway.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,565,002 Dated February 23, 1971

Inventor(s) WALTER BOHM

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Kindly amend the Patent Heading to show the inventor's correct name as BOHM rather than BOEHM.

Signed and sealed this 3rd day of August 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, :
Commissioner of Patent