

ROTARY SCREEN TEXTILE PRINTING MACHINE

FIELD OF THE INVENTION

The present invention relates to a rotary screen textile
5 printing machine.

DESCRIPTION OF PRIOR ART

Rotary screen textile printing machines have a bar
extending through a rotary screen, which bar is provided with
10 a stopper for positioning a roller squeegee at a predetermined
location within the rotary screen.

Conventionally, such a bar extends from a bearing on one
end side of the rotary screen and passes through another
bearing on the other end side (see Fig. 7). This bar is
15 substantially connected to the bearings in a detachable
manner. In Fig. 7, the reference numeral 1 indicates a rotary
screen, 4 and 5 indicate machine frames of a textile printing
machine, 6 indicates a bearing, 7 indicates a base, 10
indicates a bar, and C indicates a connecting member for the
20 bar 10. The connecting member C is attached to the bearing 6
with a bolt. The bearings 6, 6 are connected to a support 60.

However, there are the following problems in such a
conventional technique of connecting a bar at its opposite
ends.

Prior to replacing the rotary screen 1, it is necessary to withdraw the bar 10 in a left or right direction and insert the bar into the rotary screen after the replacement. For each replacement, the bar has to be disconnected from the bearings at its opposite ends, and then has to be re-connected after the replacement.

The bar is usually about 2.5 - 4.0 m long and weighs about 10 - 18 kg. Accordingly, withdrawing/inserting of the bar is really laborious. Furthermore, to prevent the damage of the rotary screen, it is necessary to withdraw/insert the bar so carefully as not to hit it against the screen. For this reason, two persons in total have to attend on the opposite sides of the printing machine, i.e., on the operating side and the non-operating side of the printing machine in order to withdraw/insert the bar. This operation requires a lot of labor and is not an easy task to conduct.

SUMMARY OF THE INVENTION

The object of the present invention is to enable even only one person to replace a rotary screen of a rotary screen textile printing machine.

The present invention relates to a rotary screen textile printing machine constructed as follows.

A rotary screen textile printing machine, characterized in that: bearings supporting the opposite ends of a rotary

screen are attached to a support in such a manner that one of the bearings is movable relative to the other in the width direction of the textile printing machine; the rotary screen is detachably supported by the bearings; one end of a bar
5 extending into the rotary screen is detachably supported by a support member attached to the movable bearing; the other end of the bar extends out of the rotary screen; and the bar is supported on the machine frames of the textile printing machine at a point outside of the rotary screen in a
10 vertically rotatable manner.

Hereinafter, the term "width direction of the printing machine" shall mean the width direction of a textile to be printed on the printing machine. This applies to the appended claims and the description below.

15 Preferably, the opposite ends of the rotary screen form end rings of tapered shape. The reason for that will be later described.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Fig. 1 is a sectional view taken along the axis of a rotary screen, illustrating an example of a textile-printing machine according to the present invention;

Fig. 2 is a cross sectional view taken along Line II-II of Fig. 1;

Fig. 3 is a plan view of bearings and supports in the rotary screen textile printing machine shown in Fig. 1;

Fig. 4 is a cross sectional view taken along Line IV-IV of Fig. 3;

5 Fig. 5 is a perspective view of an end ring formed at the end of the rotary screen;

Fig. 6 is a perspective view of a base; and

Fig. 7 is a plan view showing that the bar extending through the rotary screen is connected at its opposite ends in
10 a conventional rotary screen textile printing machine.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will now be described with reference to the accompanying drawings.

15 The textile-printing machine of the present invention comprises a plurality of rotary screens 1 spaced in parallel by a predetermined distance or a single rotary screen 1, an endless belt 2 for transporting a textile to be printed, a textile-printing table 3, a drive roller (not shown) for
20 driving the endless belt 2 or the like mounted on machine frames 4 and 5 of a textile-printing machine. These components may be inclined in the width direction of the endless belt 2, or may be horizontal relative to the width direction of the endless belt 2.

Formed at the opposite ends of the rotary screen 1 are end rings 1R, 1R of a smaller diameter than that of the rotary screen 1. Bearings 6, 6 on the opposite sides of the rotary screen 1 are mounted on a support 60 in such a manner that one
5 of the bearings is movable relative to the other, e.g., the right bearing in Fig. 1 is movable in the width direction of the textile printing machine (i.e., a left or right direction of Fig. 1). More specifically, one of the bearings 6, 6 is immovably attached to the support 60, and the other bearing is
10 supported by the support 60 slidably in the width direction of the textile printing machine. The slidable bearing 6 is guided along a guide rail 61. The bearings 6, 6 are supported by the support 60 in such a cantilevered manner that they project from the support 60 in the lengthwise direction of the
15 belt 2.

Bases 7, 7 are supported within the bearings 6, 6 rotatably about their axes. The end rings 1R, 1R are detachably fitted in the bases 7, 7. Accordingly, the rotary screen 1 is detachably supported by the bearings 6, 6.
20 Engaging members 71 are finned at the ends of the bases 7, 7. Likewise, engaging members 12 are finned at the ends of the end rings 1R, 1R. The engaging members 71 and 12 are formed in plurality, as illustrated in Figs. 5 and 6. When the engaging members 71 and 12 on one side of the screen engage

with each other, the engaging members 71 and 12 on the opposite side engage with each other.

When one of the bearings 6, 6 (the right bearing 6 in Fig. 1) is pulled in the right direction of Fig. 1 by an air-cylinder (not shown) or the like, the rotary screen 1 is axially tensioned to become rigid. The thus-tensioned rotary screen 1 becomes integral with the bases 7, 7 and therefore can rotate therewith. The rotary screen 1 is rotated synchronously with the endless belt 2 as in conventional rotary screen printing machines.

A bar 10 extends through the substantially entire length of the rotary screen 1. The front end of the bar 10, i.e., the end extending into the rotary screen 1 terminates within the base 7 on the front end side of the bar 10 and is detachably supported by a support member 19 disposed at a predetermined location within the base 7. The rear end of the bar 10 extends out of the rotary screen 1. A slidable bearing is employed as the bearing 6 on the front end side of the bar 10. The support member 19 is attached to a bracket 19a on the bearing 6 on the front end side.

Further, a bracket 8 is provided on the machine frame 5. The bar 10 is vertically rotatably supported via a pivot 9 at a point outside of the rotary screen 1. At another point outside of the rotary screen 1, the bar 10 is connected via a

pivot 16 to a clevis 15 attached at the top end of a plunger 14a of an air cylinder 14 which is provided on the frame 5. At the opposite end of the plunger 14a relative to the pivot 16, the air cylinder 14 is connected to a bracket 22 via s
5 pivot 13.

The bar 10 is provided, via an attachment member 21, with a stopper 20 for positioning a roller squeegee 11 at a predetermined location within the rotary screen 1. The stopper 20 extends in parallel with the rotary screen 1.

10 The bar 10 is of the hollow type having a number of holes 10-1 on its cylindrical surface and thus act as a member for supplying washing water into the rotary screen 1. Connected via a coupler 17 to the start end of the hollow type bar is a washing water hose 18.

15 It is shown in Fig. 1 with solid lines that the end rings 1R, 1R are fitted in the bases 7, 7, that is, the rotary screen 1 is supported by the bearings 6, 6.

To remove or disconnect the end rings 1R, 1R from the bases 7, 7, in other words, to detach or disconnect the rotary
20 screen 1 from the bearings 6, 6, the axial tension of the rotary screen 1 is released, and then the rotary screen 1 is manually rotated relative to the bases 7, 7, so that the engaging members 12 and 71 are disengaged. Thereafter, the right bearing 6 in Fig. 1 is moved in the right direction of

Fig. 1 relative to the rotary screen, and then the rotary screen 1 is moved in the right direction of Fig. 1 relative to the opposite base 7, thereby achieving the detaching operation.

5 If the end rings 1R, 1R are disengaged from the bases 7, 7, the rotary screen 1 is disconnected from the bearings 6, 6.

 The rotary screen 1, having the end rings 1R, 1R disconnected from the bases 7, 7, is connected again to the bearings 6, 6 by the following steps of: i) fitting the end
10 rings 1R, 1R in the bases 7, 7 such that the engaging members 71 and 12 do not face each other; and ii) rotating the rotary screen 1 about its axis relative to the bases 7, 7 so as to engage the engaging members 71 and 12 with each other.

 When the bar 10 is upwardly rotated by the air cylinder
15 14 with a pivot 9 being a point of support, the front end of the bar 10 contact the end ring 1R on the front end side. When the bar 10 is further rotated upwardly, the rotary screen 1, which is disconnected from the bearings 6, 6, follows the upward rotation of the bar 10.

20 When the rotary screen 1 is upwardly rotated to a predetermined level, the air cylinder 14 stops so that the rotary screen 1 can be withdrawn in the right direction of Fig. 1 relative to the bar 10. In this case, since the rotary screen 1 has followed the rotation of the bar 10, i.e., has

been raised to the said level, even only one person can withdraw the rotary screen 1 using the bar 10 as a guide or a jig.

To mount the rotary screen 1 on the machine frames 4 and 5 again, too, even only one person can fit the rotary screen 1 to the bar 10 using the bar 10 as a guide or a jig.

The rotary screen 1 may be mounted on the machine frames 4 and 5 again according to the reverse operation to the case where the rotary screen 1 is disconnected from the bearings 6,
10 6.

According to the present invention, the opposite bearings are attached to the support in such a manner that one of the bearings is movable relative to the other in the width direction of the textile-printing machine (this construction
15 being referred to as "A" for convenience). The rotary screen is detachably supported in these bearings (for convenience, this construction being referred to as "B"). The constructions A and B enables even only one person to disconnect the rotary screen from the bearings on the opposite
20 end sides of the rotary screen, with the bearings being still attached to the textile-printing machine.

According to the present invention, the bar, which extends through the substantially entire length of the rotary screen, is detachably supported by a support member at its
25 front end, i.e., the end extending into the rotary screen. At

the same time, the bar is vertically rotatably supported on the machine frames at a point outside of the rotary screen (this construction being referred to as "C" for convenience). The construction C enables even only one person to detach the
5 rotary screen using the bar as a guide or a jig by rotating the bar upwardly to a level where the rotary screen can be withdrawn after disconnecting the rotary screen from the opposite bearings.

The rotary screen is remounted on the machine frames by
10 the reverse procedure to the case where the rotary screen is disconnected from the opposite bearings (i.e., substantially the same operation). Accordingly, even only one person can do the remounting operation in this case, too.

Thus, the present invention enables even only one person
15 to replace a rotary screen in order to change a printing design pattern, color or the like.

In the present invention, when the opposite ends of the rotary screen are the end rings of a smaller diameter than that of the rotary screen, the said constructions A, B and C
20 are more advantageously employed, since the printing portion of the rotary screen is prevented from contacting or hitting the bar that extends through the rotary screen.

As seen above, the present invention enables even only one person to replace a rotary screen of a rotary screen
25 textile printing machine.



We claim:

1. A rotary screen textile printing machine comprising a rotary screen 1 and a bar 10 extending through the substantially entire length of the rotary screen 1, characterized in that: bearings 6, 6 supporting the opposite ends of the rotary screen 1 are attached to a support 60 in such a manner that one of the bearings 6, 6 is movable relative to the other in the width direction of the textile printing machine; the rotary screen 1 is detachably supported by the bearings 6, 6; the end of the bar 10 extending into the rotary screen 1 is detachably supported by a support member 19 mounted on the movable bearing 6; and the bar 10 is supported on the textile printing machine 5 at a point outside of the rotary screen 1 in a vertically rotatable manner.

2. A rotary screen textile printing machine according to claim 1, wherein the rotary screen 1 has end rings 1R, 1R of a diameter smaller than that of the rotary screen 1.