

SPECIFICATION

Transfer drum

The invention relates to a transfer drum for perfecting printing presses with two sheet carrier surfaces which are each constituted by two mutually interlacing sheet carrier combs, whilst one sheet carrier comb exhibits a device for gripping the sheet leading edge and at least one of the two mutually interlacing sheet carrier combs is adjustable with reference to the other about the axis of rotation of the transfer drum.

The production of transfer drums of the type initially defined demands very high precision because the sheets transported by the two sheet carrier surfaces must be transferred precisely evenly, otherwise mackle occurs.

The reason is as follows:

Such transfer drums generally consist of a stationary drum section with two diametrically opposite devices for gripping the sheet leading edge and a drum section adjustable about the axis of rotation with two likewise diametrically opposite devices for gripping the sheet trailing edge. The particular sheet being transported rests snugly upon the sheet carrier surface. In certain cases e.g., suction devices are present in order to ensure this contact. Now if, due to a circularity or formal error, one of the sheet carrier surfaces is located higher than the other, the position of the end of print of two consecutive sheets becomes different. The result of this is a rhythmic mackle in the print after the sheet turn. A circularity error of only e.g., 0.02 mm can result in a mackle of approx. 0.05 mm, depending upon the sheet length.

In the case of the perfecting printing presses known commercially, any height difference between the sheet carrier surfaces of the transfer drum detected after proofing the press is compensated by covering the lower lying sheet carrier surface with adhesive tapes, e.g., aluminium foils. However, the adhesive tapes may become detached by the cleaning of the surfaces. The application of the various adhesive tapes is furthermore complicated and time-wasting.

The invention provides a remedy here. According to the aim, it is proposed to provide on the transfer drum of a perfecting printing press a device whereby, after the machine has been proofed, mackle phenomena attributable to circularity or formal errors of the transfer drum can be eliminated.

This aim is achieved according to the invention in that portions of the sheet carrier surfaces, or the sheet carrier surfaces as an entity, are radially adjustable. Consequently it is not only possible to compensate circularity and formal errors, but it is also possible to correct subsequent variations in the adjustable parts of the transfer drum.

A particularly advantageous embodiment of the invention, comprising a basic drum element with sheet carriers and the device for gripping the sheet leading edge, and a hollow element partly surrounding the basic drum element with sheet carriers and with a device for gripping the sheet

trailing edge, provides that the hollow element is mounted through a slip ring in each case on the two cylinder journals provided on the basic drum element, that play is provided between cylinder journals and slip ring, and that adjusting screws are arranged in the hollow element which influence the slip ring and by deforming the slip ring eliminate locally the play between the slip ring inner surface and cylinder journal running surface and/or adjust the sheet carriers radially.

This embodiment of the invention not only permits the radial adjustment of the entire sheet carrier surfaces, but also makes it possible in a very simple way during the initial assembly, or during subsequent repair assemblies, to adjust without play and align centrally the adjustably mounted hollow element.

A further advantageous embodiment of the invention relates to a transfer drum with a sheet carrier comb composed of individual sheet carrier segments, on one end of which the device for gripping the sheet leading edge is provided, and with a further sheet carrier comb likewise constituted by individual sheet carrier segments, at one end of which a device for gripping the sheet trailing edge is arranged, whilst all the sheet carrier segments are mounted on a common axle.

On a transfer drum of this type, according to the invention some or all of the sheet carrier segments are mounted on the axle by a slip ring, whilst play is provided between the slip ring inner surface and the axle, and whilst furthermore, in those sheet carrier segments provided with a slip ring there are arranged adjusting screws which influence the slip ring and, by deforming the slip ring, eliminate locally the play between slip ring inner surface and the axle and/or adjust the sheet carrier segments radially.

The inventive measures here present not only the advantage of compensating circularity and formal errors, but also the possibility of adjusting the individual sheet carrier segments mutually in a simple manner.

The two embodiments of the invention mentioned may also be varied so that, the slip rings being eliminated, the adjusting screws directly influence the cylinder running surface and/or the axle. The sheet carrier combs or the sheet carrier segments may also be provided with adjusting screws, by means of which the sheet carriers are deformable, so that the free sheet carrier ends can be adjusted radially.

The invention is explained more fully herein below with reference to a number of embodiments illustrated in the accompanying drawing, wherein:

Fig. 1 shows a side elevation of a transfer drum with two sheet carrier surfaces, in which a part of the sheet carrier surfaces is radially adjustable by adjusting screws.

Fig. 2 shows a longitudinal section through the transfer drum according to Fig. 1.

Figs. 3—5 show a bearing of the hollow element mounted adjustably on the cylinder journals of the transfer drum with different adjustments of the

adjusting screws,

Fig. 6 shows a transfer drum with two sheet carrier surfaces, which is constituted by two sets of sheet carrier segments mounted on an axle, and

Fig. 7 shows the transfer drum according to Fig. 6, in which four sheet carrier segments are provided with adjusting screws at their bearings.

The transfer drum according to Figures 1 and 2 substantially comprises two principal sections, namely the basic drum element 1 and the hollow element 2. The basic drum element 1 is mounted firmly on the axle 3, upon the free cylinder journals 4 and 5 of which the hollow element 2 is mounted rotatably through a slip ring 6 in each case.

The basic drum element 1 is provided with two diametrically opposite sheet carrier combs 7, each of which is fitted on its one side with sheet carriers 8 arranged comb-fashion and at its other side with a device 9 for gripping the sheet leading edge.

The hollow element 2 is provided in the same manner with diametrically opposite sheet carrier combs 10 which exhibit on the side confronting the adjacent sheet carrier comb 7, sheet carriers 11 which are arranged comb-fashion and carry on their one side a device 12 for gripping the sheet trailing edge.

The slip rings 6 already mentioned are secured by a force fit in the two bearing hubs 13 of the hollow element; four adjusting screws 14, which influence the slip ring 6, are also screwed into each bearing hub 13 distributed uniformly on the circumference.

In each case a sheet carrier comb 7 and a sheet carrier comb 10 conjointly form a sheet carrier surface 15. By adjusting the hollow element 2 about the axle 3, the sheet carriers 8 and 11 arranged mutually staggered can be interlaced or separated into their extreme position according to Figure 1. The position of the sheet carrier combs 7 and 10 illustrated in Figure 1 corresponds to the largest sheet format.

Figures 3, 4 and 5 show the special arrangement of the bearings of the hollow element 2. The slip ring 6 is, as already mentioned, secured by a force fit in the bearing hub 13. A play 18 of e.g., 0.05 mm is provided between the slip ring inner surface 16 and the running surface 17 of the cylinder journals 4 and 5.

After slackening the check-nuts 19, all the adjusting screws 14 are screwed into the position according to Figure 4. The slip ring 6 is thereby deformed in the manner illustrated. The consequence is a local forcing out of the play. The cylinder journals 4 and 5 are now adjusted without play. The check-nuts 19 are retightened. The installation of the transfer drum into the perfecting printing press is performed in this adjustment.

If a mackle appears during the proofing of the perfecting printing press as a result of the abovementioned errors, then the hollow element may be adjusted radially by a maximum of the total play, the one sheet carrier 11 being lowered and the opposite sheet carrier 11 raised radially

outwards. Figure 5 shows the corresponding adjustment of the adjusting screws 14 and of the slip ring 6. The adjusting screw 14 located respectively at the bottom and at the top in Figure 5 was left unaffected by the adjustment in the case illustrated. Only the left-hand adjusting screw 14 was screwed out by the total play, and the right-hand adjusting screw 14 in by the total play. The result is a corresponding eccentric displacement of the hollow element 2 by the play 18. Obviously, in case of need the hollow element 2 could additionally be displaced eccentrically by the same play 18 by means of the top and bottom adjusting screws. The adjustment of the sheet carrier combs 10 of the hollow element 2 is sufficient to eliminate completely the rhythmic mackle phenomena which had arisen.

Figures 6 and 7 show a transfer drum with two sheet carrier surfaces 15, in which two sets of sheet carrier segments 20 and 21 are threaded onto the axle, namely so that the sheet carrier segments 20 and 21 alternate. The sheet carrier segments 20 are fitted firmly on the axle 3 and are unified by mutually diametrically opposite devices 9 for gripping the sheet leading edge to form sheet carrier combs 7.

The other sheet carrier segments 21 are likewise mutually connected, namely by the device 12 for gripping the sheet trailing edge. The sheet carrier segments 21 thus constitute the two mutually diametrically opposite sheet carrier combs 10.

Since all the sheet carrier segments 21 are mounted adjustably about the axle 3, the sheet carriers 8 and 11 of the sheet carrier surfaces 15 can be interlaced or separated into the position illustrated.

As may be seen from Figure 7, the bearing hubs 13 of four sheet carrier segments 21, which are arranged at a certain mutual interval, are mounted rotatably on the axle 3, each through the intermediary of a slip ring 6. The bearing hubs 13 of said sheet carrier segments 21 exhibit, symmetrically to the circumference, the adjusting screws 14 previously mentioned. The construction of the bearing of all four sheet carrier segments 21 fitted with adjusting screws 14 corresponds fully and totally to that illustrated in Figures 3, 4 and 5.

The four sheet carrier segments 21 provided with adjusting screws 14 can therefore be adjusted radially in case of need. Because the remaining sheet carrier segments 21 are mounted with a certain play and are globally mutually connected by the device 12 for gripping the sheet trailing edge, the adjustment affects the entire sheet carrier comb 10. Thus, in the case of a transfer drum which is composed of individual sheet carrier segments 20, 21, the possibility also exists of compensating formal and circularity errors by the adjustment according to the invention of some sheet carrier segments 21. Obviously, all the adjustable sheet carrier segments 21 may be mounted on the axle 3 by a slip ring 6 with the assistance of adjusting screws 14.

Even with the most precise production of machine components of the order of magnitude of transfer drums of the type discussed, small production tolerances cannot be excluded if economy of production is to be maintained. The invention provides the possibility to eliminate even the smallest production inaccuracies which might still have a negative influence upon the impression.

10 COMPONENT LIST

- 1 Basic drum element
- 2 Hollow element
- 3 Axle
- 4 Cylinder journal
- 15 5 Cylinder journal
- 6 Slip ring
- 7 Sheet carrier combs
- 8 Sheet carriers
- 9 Device for gripping the sheet leading edge
- 20 10 Sheet carrier combs
- 11 Sheet carriers
- 12 Device for gripping the sheet trailing edge
- 13 Bearing hubs
- 14 Adjusting screws
- 25 15 Sheet carrier surfaces
- 16 Slip ring inner surface
- 17 Cylinder journal running surface
- 18 Play
- 19 Check-nuts
- 30 20 Sheet carrier segments
- 21 Sheet carrier segments

CLAIMS

1. Transfer drum for perfecting printing presses

- 35 with two diametrically opposite sheet carrier surfaces which are each constituted by two sets of sheet carriers interlacing comb-fashion, whilst one of the two sheet carrier sets of a sheet carrier surface exhibits a device for gripping the sheet leading edge and the two sheet carrier sets
- 40 constituting a sheet carrier surface are mutually adjustable about the axis of rotation of the transfer drum, and wherein further each sheet carrier is firmly connected to a diametrically opposite sheet carrier of the other sheet carrier surface and mounted on the axle of the transfer drum,
- 45 characterised in that some or all of the mutually diametrically opposite and firmly mutually connected sheet carriers (8 or 11) are mounted radially adjustably in common.
- 50 2. Transfer drum according to Claim 1, wherein two mutually opposite sheet carrier sets belong to a basic drum element and each of them is provided with a device for gripping the sheet leading edge, whereas the two other sheet carrier
- 55 sets are arranged on a hollow element partly surrounding the basic drum element and each exhibit a device for gripping the sheet trailing edge, characterised in that,
 - a) the hollow element (2) is mounted by a slip ring (6) in each case on the two cylinder journals (4, 5) provided on the basic drum element (1),
 - b) play (18) is provided between cylinder journals (4 and 5) and slip ring (6) and
 - c) adjusting screws (14) are arranged in the
- 60 hollow element (2) which influence the slip ring (6) and by deforming the slip ring (6) locally eliminate the play (18) between slip ring inner surface (16) and cylinder journal running surface (17) and/or radially adjust the sheet carriers (11).
- 65 3. Transfer drum according to Claim 1, wherein two diametrically opposite sheet carrier sets are composed of sheet carrier segments and each of them is provided with a device for gripping the sheet leading edge, whereas the two remaining
- 70 sheet carrier sets likewise consist of individual sheet carrier segments and each exhibits a device for gripping the sheet trailing edge, characterised in that
 - a) some or all of the sheet carrier segments (21) are mounted on the axle (3) by a slip ring (6),
 - b) play is provided between the slip ring inner surface (16) and the axle (3), and
 - c) adjusting screws (14) are arranged in the
- 75 sheet carrier segments (21) provided with a slip ring (6) which influence the slip ring (6) and by deforming the slip ring (6) eliminate locally the play (18) between slip ring inner surface (16) and the axle (3), and/or radially adjust the sheet carrier
- 80 segments (21).
- 85



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 - 85 ring (6) which influence the slip ring (6) and by deforming the slip ring (6) eliminate locally the play (18) between slip ring inner surface (16) and the axle (3), and/or radially adjust the sheet carrier segments (21).