Sept. 12, 1944. T. R. SCOLES ET AL 2,358,188

CLOTH LAYING APPARATUS

Filed June 23, 1941 2 Sheets-Sheet 1

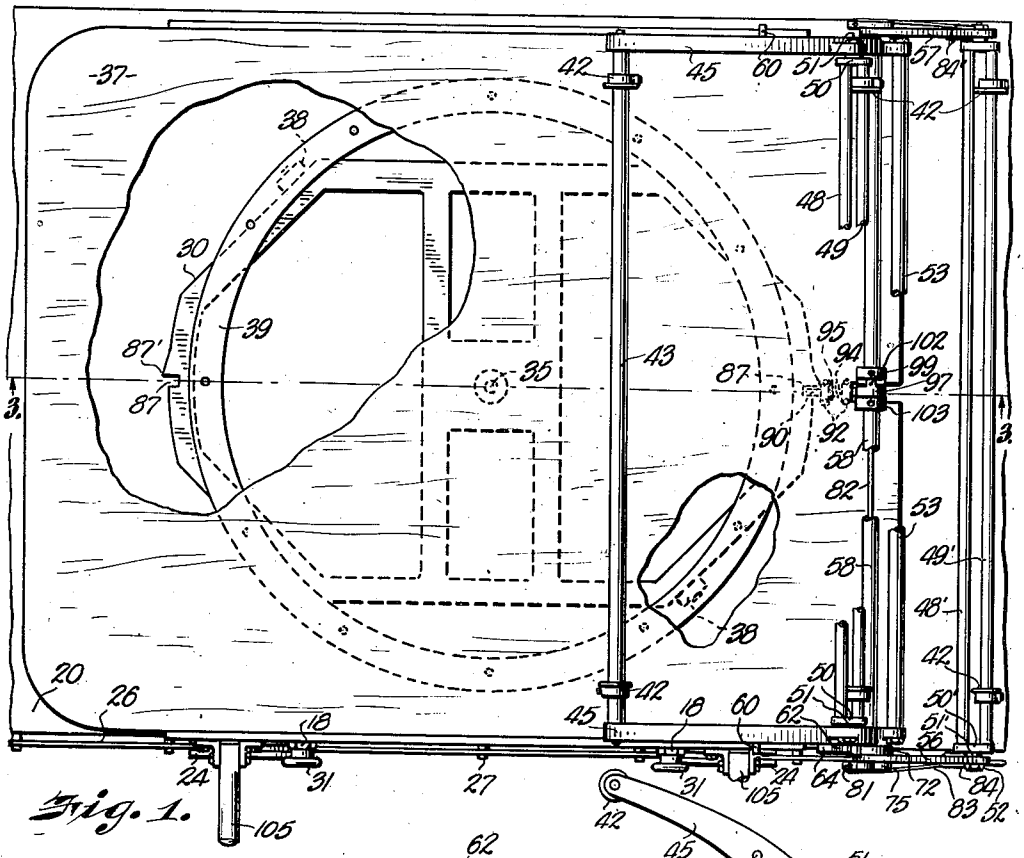


Fig. 1.



Fig. 7.

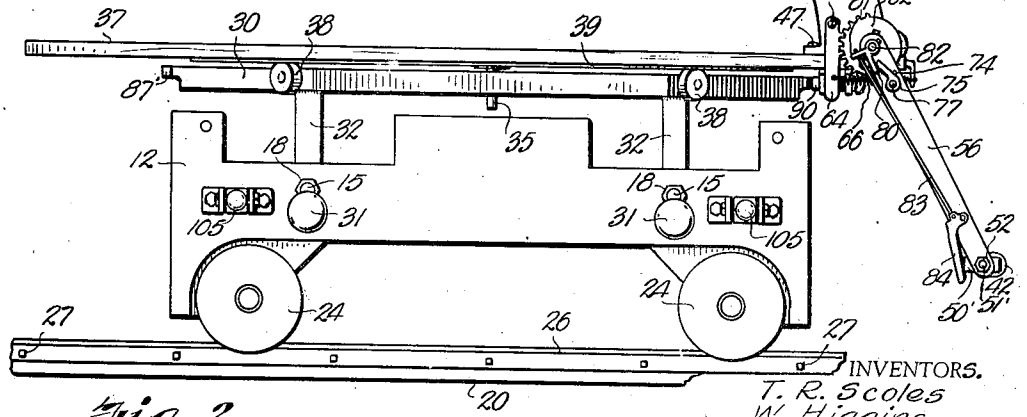


Fig. 2.

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CLOTH LAYING APPARATUS

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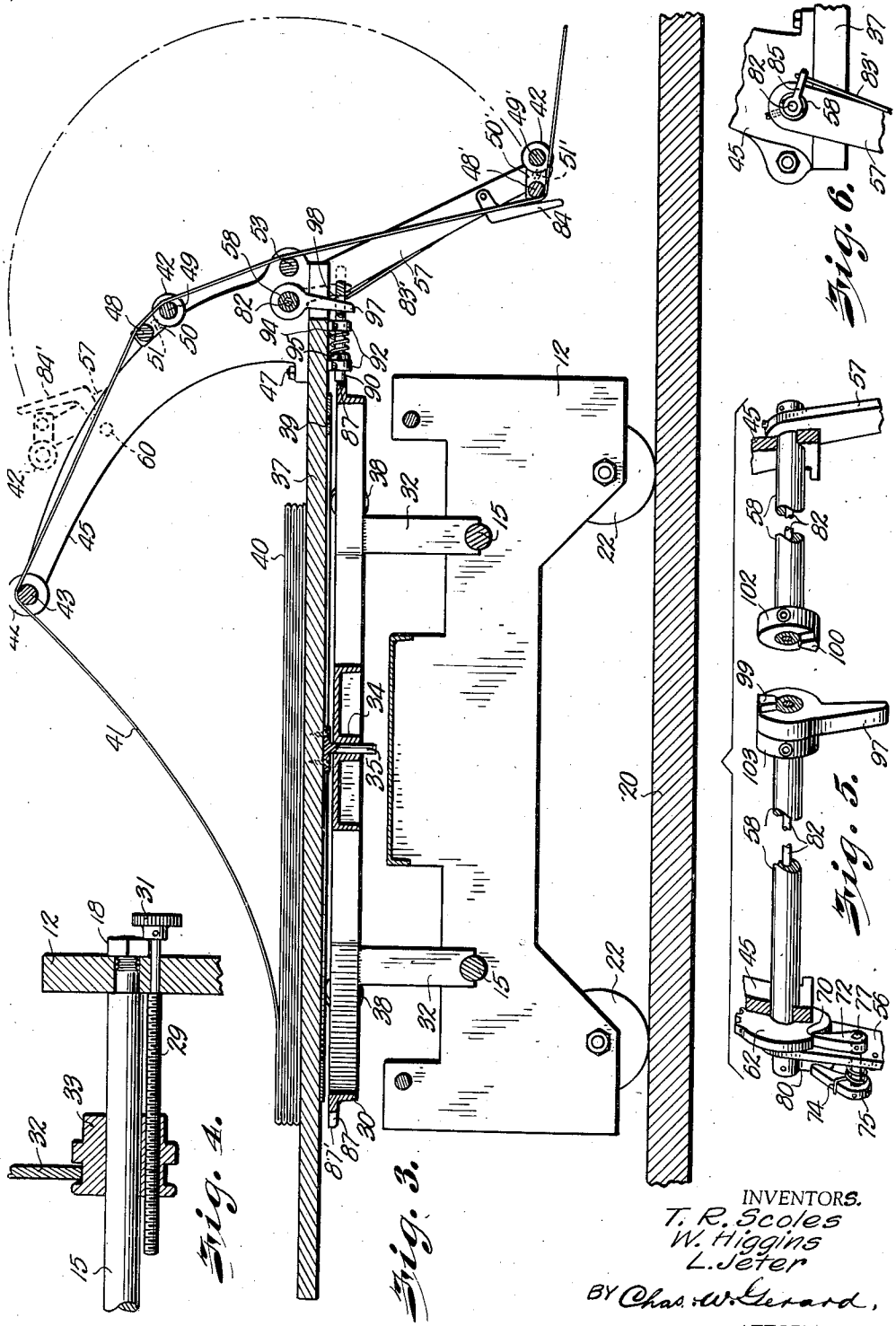


Fig. 3.

Fig. 4.

Fig. 6.

Fig. 5.

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CLOTH-LAYING APPARATUS

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Application June 23, 1941, Serial No. 399,418

7 Claims. (Cl. 270—31)

The present invention relates to improvements in cloth-laying machines designed to lay lengths or strips of material from a continuous web of the material, in superposed layers or stacks upon a cutting table.

More particularly the present improvements relate to apparatus for laying such material as it is fed from a supply of the material in "flat-folded" condition. In such operation the apparatus travels back and forth over the cutting table while the material is trailed thereon through the medium of guiding and spreading means; and we have found that it increases the effectiveness of such operation to reverse the guiding and spreading means with reference to the remainder of the apparatus at each reversal of its travelling movement along the cutting table.

Accordingly the present invention comprises apparatus of this character which includes a rotary table for carrying the material supply, and cloth trailing or laying means comprising cloth guiding and spreading means adapted to be folded or manipulated in such a way as to facilitate the reversal of said table according to the direction of travel of the apparatus.

The invention further comprises means for latching the cloth guiding and spreading means in operative position and for releasing the same for folding purposes; in connection with which provision is also made for automatically latching the rotary table after reversal of the same.

Still further features of improvement comprise means for adjusting the height of the cloth guiding and spreading means from time to time in accordance with the height of the stack of cut lengths or strips of material which have been deposited upon the cutting table; and also suitable provision for adjusting the rotary table laterally with reference to the remainder of the apparatus for causing one of the side edges of the web of material to register or aline with a fixed longitudinal line along the cutting table.

With the foregoing general objects in view, the invention will now be described in detail by reference to the accompanying drawings wherein is illustrated one form of construction which we have devised for the embodiment of the proposed improvements—after which those features and combinations which we deem to be novel and patentable will be particularly set forth and claimed.

In the drawings—

Figure 1 is a plan view (with portions broken away) illustrating an apparatus constructed in accordance with the present invention;

Figure 2 is a side elevation of the same;

Figure 3 is a sectional elevation, on a somewhat larger scale, representing a section taken on the line 3—3 of Figure 1, but including a supply of "flat-fold" material with the web therefrom extended through the cloth guiding and spreading structure;

Figure 4 is an enlarged sectional detail of one of the table-adjusting devices;

Figure 5 is an enlarged fragmentary and perspective view showing the supporting shaft for the lower portion of the cloth guiding and laying means, and details of the adjusting and latching means therefor;

Figure 6 is an enlarged fragmentary elevation showing connections at one end of said supporting shaft; and

Figure 7 is a further detail of a portion of said adjusting and latching means.

The present application relates to improvements in the same general type of apparatus as that illustrated in our copending application Serial No. 367,050, filed November 25, 1940.

Referring now to the drawings in detail, our improved apparatus is illustrated as comprising a wheeled carriage made up of side frame members 12 for the opposite sides of the apparatus and connected in spaced and parallel relation by means of tie rods or bars 15 and clamping or securing nuts 18 (see Figure 4). This carriage structure is designed for movement lengthwise over the top of a fixed cloth cutting table 20 upon which the cloth material is to be laid or deposited, and accordingly the carriage is provided with wheels or rollers for rolling travel, as for example a pair of plain-faced wheels 22 at one side of the carriage for resting directly upon the top of the cutting table 20 and a pair of grooved wheels 24 for travel along a track rail 26 which is anchored by means of bolts 27 or the like to one side edge of said table, as illustrated in Figures 1 and 2—or in substantially the same manner as set forth in said copending application.

Supported upon a pair of the tie rods or bars 15 is a horizontal framework 30 having depending legs 32 supported upon said cross bars 15, the legs 32 at one side of the apparatus having forked or yoke-shaped lower ends for engagement with grooved collars 33 mounted for sliding adjustment along said bars 15 by means of adjusting screws 29 which are provided with suitable exterior knobs 31 (see Figure 4).

The central portion of this framework 30 is formed with a suitable bearing 34 for receiving a vertical spindle 35 depending from the bottom face of a rotary table 37 as illustrated in Figure 3. The framework 30 is also provided with a set of rollers 38 for supporting engagement with the under face of the table 37, which is provided with a wear strip or track 39 for contact with said rollers 38.

This rotary table 37 is designed for the support of the cloth material, the supply of which takes the form of plain alternately lapped or folded

layers, as indicated at 40, from which the web of the material 41 is paid off or fed between adjustable guide collars 42 on a cross bar 43 carried by the upper ends of a pair of angular brackets 45 secured, as indicated at 47, to the upper face of the table 37 at one end thereof.

From the cross bar 43 the material 41 is carried over or between a pair of auxiliary guide rollers 48 and 49, the opposite ends of which are journaled on plates 50 having studs or pins 51 pivoted for angular adjustment with reference to the brackets 45, to which they are secured by means of clamping nuts 52. From these guide rollers 48 and 49, the material is passed over a roller 53 mounted in the base portions of the brackets 45, and thence over or between another pair of guide rollers 48' and 49' journaled on plates 50' having pivot pins or studs 51' for clamping adjustment to the outer ends of a pair of arms 56 and 57 at the opposite sides of the apparatus. These arms 56 and 57 are attached to the opposite ends of an oscillatory shaft 58 which is journaled in the lower ends of the brackets 45, so that said arms are thus mounted for swinging movement into the position represented by the dotted lines in Figure 3, where they are supported in engagement with stop pins 60 projecting outwardly from said brackets 45.

As shown in Figures 1 to 3, the guide rollers 49 and 49' are also provided with adjustable collars 42 the same as the cross bar 43, for guiding engagement with the side edges of the web material 41.

Provision is made for latching the arms 56 and 57 in lower positions and at different heights according to the height of the material as it is stacked upon the cutting table 20, and also for simultaneously releasing both arms for swinging movement upward into inoperative position while the apparatus is being reversed for travel in an opposite direction.

For this purpose a gear segment 62 is mounted on one end of the shaft 58 in position for engagement of the teeth of said segment with a toothed latch member 64 pivoted at 65 to the adjacent bracket 45 and also provided with a coil spring 66 adapted to pull the member 64 normally in a direction for maintaining the same in latching engagement with the segment 62, as represented in Figure 2. By pushing the latch member 64 away from said segment 62 (or against the spring action) the operator can manually release said latching engagement in order to shift the segment for the purpose of varying the height of lower guide members 48' and 49'. A stop pin 67 is carried by the segment 62 in position for engagement with the arm 56 in such a way as to limit its lowering movement.

Provision is also made for not only latching said arms 56 and 57 in their lower or operative position during the travel of the apparatus in either direction, but also for operating the latching means for releasing the same from either side of the apparatus. For this purpose the segment 62 is formed with a shoulder 70 for engagement with a pawl 72 which is maintained normally in latching engagement with said shoulder by means of a spring 74 acting upon a dog 75 mounted on a rocker shaft or pin 77 journaled in the arm 56 and having said pawl 72 and dog 75 secured to the opposite ends thereof (Figure 5). The dog 75 is adapted to be actuated (for disengaging said pawl 72 from the shoulder 70) by means of a finger 80 secured to one end of a shaft 82 extending axially through the shaft 58, said finger having a projection 81 for connection to an operating link 83 leading to a handle 84 pivoted to the lower end portion of the arm 56 (see Figure 2). The other end of the shaft 82 is also provided with a finger 85 for connection to a similar operating link 83' and handle 84' on the other arm 57 (see Figure 6), whereby the disengagement of said pawl 72 from the shoulder 70 may be effected from either end of said shaft 82, as is necessary, since the table 37 is reversed in position at each change or reversal of its direction of travel along the cutting table 20.

It is also necessary to latch the rotary table 37 in each of its two opposite positions, i. e., for travel in opposite directions along the table 20. Accordingly said table 37 is provided with marginal recesses 87 at diametrically opposite points for engagement with a latch bar 90 slidingly mounted in bearing brackets 92 secured to the under face of that end of the table 37 which carries the bracket members 45, as shown in Figure 3. A coil spring 94 is mounted on said latch bar 90 and in engagement with a collar 95 secured to the bar in such relation as to actuate the latter normally into latching engagement with one or the other of said recesses 87.

The sliding latch bar 90 is retracted automatically by the throwing of the arms 56 and 57 upwardly into folding or inoperative position preparatory to reversing the table 37 for travelling movement in the opposite direction. This is accomplished by providing a retracting finger 97 having a collar portion loosely mounted on the shaft member 58, with the lower end of said finger projecting through a slot 98 in the latch bar 90 (see Figure 3). The collar portion of said finger 97 is also provided with a lug or shoulder 99 adapted to engage a shoulder 100 formed on a collar 102 adjustably secured to said shaft 58 (see Figure 5). A set collar 103 is mounted adjacent to said finger 97 for maintaining the latter in operative relation to the collar 102. From this construction it is apparent that rotation of the shaft 58 (on raising of arms 56 and 57 into table-reversing position) will, by engagement of said lugs 99 and 100, actuate the finger 97 as required for the latch-retracting or unlatching function between successive reversals of the operation of the apparatus.

In the operation of the apparatus, the flat-folded material is placed upon the rotary table 37 as represented at 40 in Figure 3, and the free end portion 41 thereof carried up over the guide bars 43 and 53, and also over or between the pairs of guide rollers 48—49 and 48'—49', depending on the character and weight of the cloth material—lighter material requiring a more weave-like feeding action than relatively heavier materials in order to lay and deposit the same in a flat and smooth condition. In this connection it may be pointed out that where the material is threaded through between said guide rollers, the drag on the material may be varied according to the adjustment of said rollers upon their supporting pins 51 and 51' as already explained. The arms 56 and 57 are let down into their lower position for trailing the cloth material over the top of the table 20 as the apparatus is moved to the left in Figure 3. The adjustment to initial lowermost position is effected by unlatching the pawls 72 by means of either of the handles 84 or 84' and lowering said arms 56 and 57 and at the same time holding the latch 64 away from the segment 62 while the latter is turned clockwise (in Figure 2) by engagement of arm 56 with

the pin 67; after which the latch member 64 is released for relatching the segment 62 in the desired position.

At this time the rotary table 37 is adjusted transversely, by means of the adjusting screws 31, in order to aline one edge of the cloth material 41 along a definite longitudinal table line—such as a line adjacent to and parallel with the track 22.

The extreme free end of the cloth material is then placed and held in starting position (as by means of a suitable weight), and the operator proceeds to push the apparatus back and forth along the table by means of handle members 105 of the same type as illustrated in our aforesaid pending application. The extent of travel between reversals depends upon the length of the strips to be cut, the material being cut at the end of each successive strip and then weighted before reversing the position of the table 37. After cutting and weighting each new strip the arms 56 and 57 are unlatched by means of one of the handles 84 or 84', so that the arms are free to be swung up into the dotted line position shown in Figure 3, as required for lifting the free end of the material up off the table 20 and thus facilitating the turning of the table 37. This swinging of the arms 56—57 simultaneously rotates the shaft 58 and causes the finger 97 to retract the latch bar 94, thereby unlocking the table 37 for rotary reversing movement, which movement of course takes place with a smooth and easy rolling travel by virtue of the roller bearing support above described.

In this connection it may be pointed out that the locking recesses 87 are provided with shoulders 87' in position for engaging the end of the latch bar 94 and automatically stopping such reverse movement of the table in each successive reversing operation thereof.

On reversal of the table's position, the arms 56 and 57 are again lowered, allowing the relatching of the table to take place automatically, which is followed also by the relatching of said arms in their relowered position. The apparatus is then pushed slightly to match the cut end of the web of material 41 with the end of the cut and laid strip on the table 20, and after weighting the same again, the machine or apparatus is now ready to lay a new strip by travel an equal distance in the opposite direction. Thereafter the operation is simply a repetition of the foregoing.

As the operator preferably operates from the same side of the table 20 at all times, the reversal of the table 37 brings its opposite side next to the operator, and hence the provision of the two handles 84 and 84' for alternate operation in releasing the pawl 72 to permit raising the arms 56 and 57. As the operation proceeds and the stack of cut strips of material piles up, the operator can intermittently elevate said arms above the stack by the adjustment above described, through the medium of the latch member 64 and resetting of the segment 62 in relation thereto.

While we have illustrated and described what we have found to represent a most practical and efficient construction for carrying out the proposed objects of our invention, it will be understood that the apparatus as shown is simply illustrative and may be variously modified within the spirit and scope of our invention; we therefore reserve the right to make all changes and modifications which may fairly be deemed to fall within the spirit and scope of the invention as defined by the following claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. Apparatus for laying and spreading flat-folded cloth material, comprising a travelling carriage having a table mounted thereon for movement about a vertical axis, cloth-laying and spreading means supported by said table and comprising an upper portion projecting into overhanging relation to said table and also a lower portion projecting below the table level and adapted to be moved upwardly into folded relation to said upper portion, means for latching said lower portion in its lower operative position, and means operable from either side of said table for releasing said latching means.

2. Apparatus for laying and spreading flat-folded material, comprising a travelling carriage having a table mounted thereon for movement about a vertical axis, cloth laying and spreading means supported by said table and including a lower portion movable upwardly into inoperative position above the level of said table, means for latching said table in either of two diametrically opposite positions on said carriage, and means actuated by the upward movement of said lower portion of the laying and spreading means for releasing said latching means.

3. Apparatus of the character described comprising a travelling carriage, a table mounted on said carriage and rotatable about a vertical axis, cloth laying and spreading means supported by one end of said table and including a lower portion movable into inoperative position above the level of said table, means for latching said table in either of two diametrically opposite positions on said carriage, means for latching said lower portion of the spreading means in its lower operative position, means operable from either side of the table for releasing said second latching means, and means actuated by the movement of said lower portion of the spreading means into inoperative position for releasing said table-latching means.

4. Apparatus of the character described, comprising a travelling carriage, a table mounted on said carriage and rotatable about a vertical axis, cloth laying and spreading means supported by one end of said table and including a lower portion movable into inoperative position above the level of said table, means separate from said first means for latching said table in either of two diametrically opposite positions on said carriage, means acting automatically on movement of said lower portion into operative position to operate said latching means into table-latching position, and means operating in response to movement of said lower portion into inoperative position to retract said latching means from table-latching position.

5. Apparatus of the character described comprising a travelling carriage, a table mounted on said carriage and rotatable about a vertical axis, cloth laying and spreading means supported by one end of said table and including a rocker shaft carrying cloth-spreading elements movable into operative position below and into inoperative position above the table level, means for latching said table in either of two diametrically opposite positions on said carriage, and means actuated by said shaft for rendering said latching means operative and inoperative according as said spreading elements are respectively below and above the table level.

6. Apparatus of the character described comprising a travelling carriage, a table mounted on said carriage and rotatable about a vertical axis, cloth laying and spreading means supported by said table, and a spring-actuated latch bar for locking said table against rotative movement, said table being provided at diametrically opposite points with locking recesses for engagement by said latch bar, one side of each of said recesses being formed with a projecting stop shoulder for limiting the rotative movements of the table into opposite latching positions.

7. Apparatus of the character described comprising a travelling carriage, a table mounted on said carriage and rotatable about a vertical axis, cloth laying and spreading means supported by one end of said table and including a lower portion movable into inoperative position above the level of said table, means for latching said table in either of two diametrically opposite positions on said carriage, means for latching said lower portion of the spreading means in its lower operative position, and means actuated by the movement of said lower portion of the spreading means into its inoperative position for releasing said table-latching means.

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