

Feb. 8, 1966

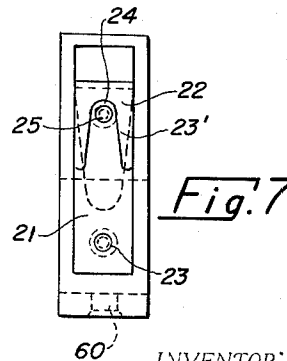
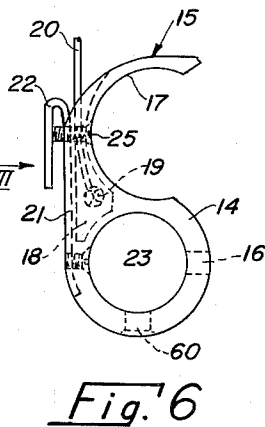
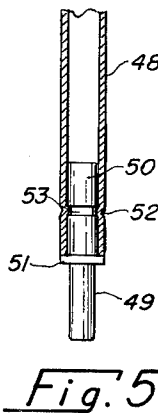
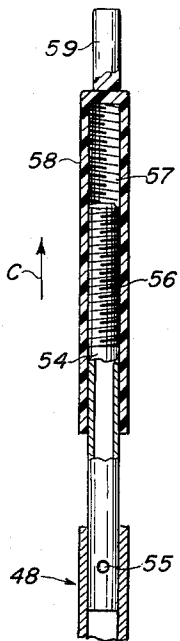
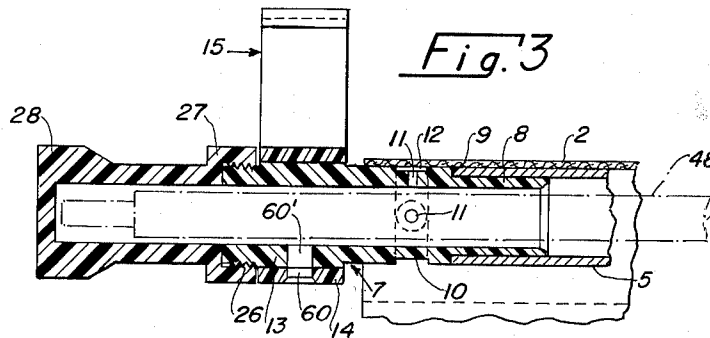
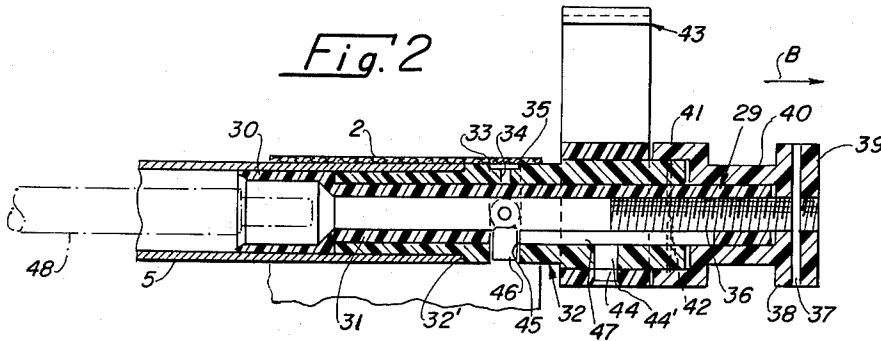
H. RIEDEL

3,233,658

PROJECTION SCREEN ADAPTED TO BE ROLLED UP

Filed July 16, 1962

3 Sheets-Sheet 2



BY

INVENTOR:
HERBERT RIEDEL

Ross & Mestere

Feb. 8, 1966

H. RIEDEL

3,233,658

PROJECTION SCREEN ADAPTED TO BE ROLLED UP

Filed July 16, 1962

3 Sheets-Sheet 3

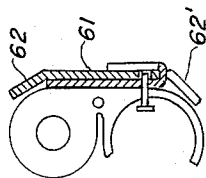


Fig. 9

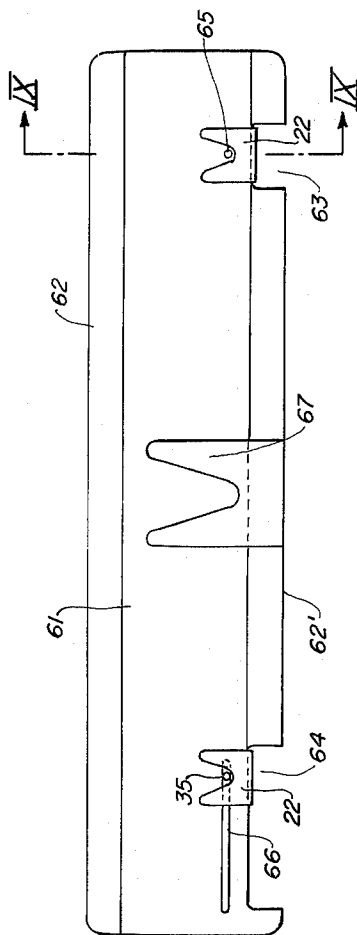


Fig. 8

INVENTOR:
HERBERT RIEDEL

BY

Ross & Mesterre

1

2

3,233,658

PROJECTION SCREEN ADAPTED TO BE ROLLED UP

Herbert Riedel, Spitalmuhlenstrasse 13,
Schwabisch-Hall, Germany

Filed July 16, 1962, Ser. No. 210,620

Claims priority, application Germany, July 21, 1961,
R 30,809

6 Claims. (Cl. 160—328)

This invention relates to a projection screen assembly adapted to be rolled up, and more particularly, to a screen assembly for the projection of transparencies and slides.

According to the invention, this screen assembly consists of a special fabric sheet which is slid over two tubular rollers, one at the top and one at the bottom end, after a loop has been made at each end.

My invention has for its object the provision of means for tensioning the screen in two directions so that this screen will be completely flat and free from folds; this is of the greatest importance for the satisfactory reproduction of pictures. In solving this problem it is also desirable to make handling as simple as possible, i.e. fool-proof, and to ensure that the screen will take up as little space as possible when rolled up ready for transportation.

According to the invention, two tubular rollers are used for tensioning the screen, the interior of these tubes also being available for accommodating elongated bracing members or rods that extend vertically outside the two vertical sheet edges when the screen is erected, the result thereof being a particularly compact arrangement when the screen is rolled up.

To enable the screen to be tensioned in the transverse direction, more particularly at the loops, each loop is secured near one of its ends to a roller, the other end of each loop being mounted on a tensioning sleeve which can be displaced relatively to the end of the roller by means of a screw-thread mechanism.

Details of the invention are particularly described with reference to the accompanying drawing in which:

FIG. 1 is an overall elevational view of a projection-screen assembly according to my invention;

FIG. 2 is an axial section through the right-hand end of the upper roller screen tube and tensioning device,

FIG. 3 is an axial section through the left-hand end of the upper roller;

FIG. 4 is a view, partly in axial section and partly in elevation, of the top end of a tensioning tube with a tensioning lock;

FIG. 5 is a view, partly in section and partly in elevation, of the bottom end of a tensioning tube;

FIG. 6 is a view of a spring clip, in side elevation;

FIG. 7 is a rear view of the spring clip in elevation, seen in the direction of the arrow VII in FIG. 6;

FIG. 8 is a view in elevation of a retaining bar; and

FIG. 9 is a cross-section through the retaining bar, with clips hooked on to the bar.

As illustrated in FIGURES 1 to 9, the projection screen assembly comprises a special fabric sheet 1 which is provided at the top and at the bottom with loops 2 and 2' indicated by the loop stitching 3 and 4 in FIG. 1. The loops 2, 2' of the fabric screen 1 are slid over tubular roller 5 and 6, respectively. Each of the two rollers 5 and 6 consists of a special thin-walled tube. A reduced end 8 (FIG. 3) of a respective tubular plug 7 is slid into the left-hand end of each roller (as illustrated for the upper tube 5 in FIG. 3) until a shoulder 9 of the plug abuts the end face of the tube. A plurality of channels are provided on the reduced end 8, and an adhesive is painted onto it and enters these channels; this adhesive secures the tubular plug inside the roller tube.

A shallow annular groove 10 on the tubular plug 7 communicates with bores 11 spaced 90° apart. The corresponding loop 2 or 2' is slid over the plug until it covers the annular groove 10; prior to this, an adhesive is introduced into the annular groove, and the screen after having been slipped over the groove is additionally secured to the tubular plug by means of tubular rivets 12. A sleeve portion 14 of a spring clip 15 is fitted over the thickened extremity 13 of the tubular plug 7 and connected thereto by means of a rivet, as described above, which is received in a mounting hole 16 (FIG. 6) in the sleeve portion 14. The spring clip 15 is provided with a resilient bow portion 17 which rises above the sleeve portion 14 and which resiliently engages the other roller tube after the screen has been rolled up, so that the two roller tubes are firmly but readily releasably interconnected for transportation.

On the rear side of the spring clip 15 (FIGS. 6 and 7) a cord-knot recess 18 is provided in which the knots 19 of a suspension cord 20 can be placed and which is closed by a plate portion 21 of a bifurcated hook 22 via a screw 23. The upper portion of the hook 22 has a fork 23'; a stud 25 extends from the bow portion 17 into the crotch 24 of this fork and is also used for securing the plate portion 21.

The tubular plug 7 is provided at its outer end with an external thread 26 (FIG. 3) on which a threaded portion 27 of a hollow screw cap 28 can be screwed.

Another tubular plug 29 is fitted into the interior of the right-hand end of the roller tube, again as specifically illustrated for the upper tube 5 (FIG. 2); a widened hollow sleeve portion 30 of this plug is provided on its outer surface with a plurality of channels, not shown in the drawing, which accommodate an adhesive by means of which the tubular plug is rigidly secured to the roller 5. The tubular plug 29 has a reduced diameter over most of its length, so that the reduced end 31 of a tensioning sleeve 32 can be slid into the annular space between the end of the roller tube and the reduced portion of the tubular plug 29, until a shoulder 32' on the sleeve abuts against the end face of the tube. The tensioning sleeve 32 is provided with a mounting groove 33 with bores 34, spaced 90° apart, into which hollow rivets 35 can be inserted and clinched after the right-hand end of the loop 2 has been secured at the annular groove 33 by means of an adhesive. On the inside of the right-hand portion of the tubular plug 29 an internal thread is provided into which a thread on a tensioning tube 36 can be screwed. The right-hand end of the threaded tensioning tube 36 is secured by a transverse pin 37 to a head portion 38 of a tensioning knob 39 having a sleeve portion 40 surrounding the outer end of the tubular plug 29.

On the other side a cylindrical flange extension 41 embraces the outer end of the tensioning sleeve 32 and is connected to this sleeve by means of a wire loop 42; this wire is slid through an inlet bore, not shown in the drawing, into an annular channel of which one half consists of an annular groove in the tensioning sleeve 32 and the other half consists of an annular groove in the cylindrical flange 41. By this means, the knob 39 is secured against axial displacement relatively to the tensioning sleeve 32 but can rotate relatively to this sleeve. A second spring clip 43 is attached to the tensioning sleeve 32, in a manner similar to the attachment of the first spring clip 15.

A guiding pin 46 introduced through a radial bore 45 in the tensioning sleeve 32 engages in a guiding groove 47 in the tensioning sleeve and prevents rotation of the tensioning sleeve but permits axial displacement of the tensioning sleeve 32 relatively to the roller tube.

To tension the screen in axial direction of the roller tube, i.e. horizontally, the knob 39 is rotated in a counter-clockwise direction, whereby the threaded tensioning tube

3

36 is screwed a greater or lesser distance out of the internal thread of the tubular plug 29 so that the knob 39 is displaced in the direction of the arrow B and also moves the tensioning sleeve 32 outwards through the intermediary of the round wire 42.

For tensioning the screen in a vertical direction, tensioning tubes 48 are provided, each of which has at its bottom end a tensioning pin 49 (FIG. 5) with a guide portion 50 which is slid into the tensioning tube until an annular collar 51 on the guide portion abuts against the end face of the tube; the portion 50 is then secured by two or more indentations 52 engaging in an annular groove 53 of that portion. A respective threaded lock tube 54 is slid onto the top end of each tensioning tube 48 and secured by a transverse pin 55. The upper part 56 of the lock tube 54 is provided with a thread which is screwed into an internal thread 57 of a lock sleeve 58 having a reduced pin 59 at the top. The pins 49 and 59 of the tubes 48 are inserted into tensioning holes 60, 44 in the spring clips 15 and 43 aligned with holes 60', 44' in sleeves 7 and 32, respectively (see also FIG. 1). To tension the screen in the longitudinal direction, the lock sleeve 58 is rotated so as to be displaced upwards relatively to the tensioning tube 48, in the direction of the arrow C (FIG. 4). The lower portion of the lock sleeve 58 and the lower portion of the tube 54 are made without threads and slidingly fit one inside the other, so that the sleeve 58 is suitably guided without tilting.

This projection screen may be suspended by means of the suspension cord 20. But if the screen is to be attached to a stand, a retaining bar 61 (FIGS. 8 and 9) is also used, which has a length corresponding to the width of the screen and is provided with flat bent-away edge portions 62, 62' at its top and bottom. At the level of the lower edge portion 62', recesses 63 and 64 are provided near the two ends of bar 61 to enable the hooks 22 on the spring clips 15 and 43 to be hooked on after the studs 25 thereof have been withdrawn, as shown in FIG. 9. After the hooks have been hooked on, the studs 25 are replaced, the stud of one spring clip engaging in a bore 65 of the retaining bar 61 whereas the stud of the other spring clip engages in a longitudinal slot 66. This longitudinal slot is necessary to permit tensioning of the screen in the direction of the roller tubes 5, 6. For hooking the retaining bar on to the stand a bifurcated main hook 67 is provided whose shape is similar to that of the hook 22 and which engages in a corresponding recess at the top of a stand.

In FIGS. 2 and 3 I have illustrated in dot-dash lines how the bracing members 48 can be received in the tubes 5, 6 when not in use, cap 28 being unscrewed from plug 7 for their insertion.

I claim:

1. A collapsible projection-screen assembly comprising a generally rectangular projection screen of flexible sheet material having a pair of horizontal longitudinal edges and a pair of vertical transverse edges; a tubular first horizontal support member extending along one of said longitudinal edges; an elongated second horizontal support member extending along the other of said longitudinal edges; a first pair of sleeves on opposite extremities of said first support member fixedly secured to said screen and projecting beyond said vertical edges thereof; a second pair of sleeves on opposite extremities of said second support member fixedly secured to said screen and projecting beyond said vertical edges in substantially vertical alignment with said first pair of sleeves; extensible bracing means secured to each of said sleeves for supporting said members at said extremities only, said bracing means

4

being adjustable in height for tensioning said screen in vertical direction by displacing said first pair of sleeves away from said second pair of sleeves; and control means traversing said tubular member in engagement with said first pair of sleeves for varying the relative spacing thereof, thereby tensioning said screen along said one of said longitudinal edges in horizontal direction.

2. An assembly as defined in claim 1 wherein said control means includes screw means threadedly engaging one of the sleeves of said first pair and rotatable relatively to said tubular member.

3. An assembly as defined in claim 1 wherein said extensible bracing means includes at least two rods detachably connectable with the corresponding sleeves of said pairs.

4. An assembly as defined in claim 3 wherein each of said rods comprises a pair of threadedly interconnected members for adjustable extension of said rods.

5. An assembly as defined in claim 1 wherein at least one of said rods is receivable within said tubular member, said tubular member being further provided with closure means for retaining said one of said rods in the interior of said tubular member.

6. A collapsible projection-screen assembly comprising a generally rectangular projection screen of flexible sheet material having a pair of horizontal longitudinal edges and a pair of vertical transverse edges; a tubular first horizontal support member extending along one of said longitudinal edges; a tubular second horizontal support member extending along the other of said longitudinal edges; a first pair of sleeves on opposite extremities of said first support member fixedly secured to said screen and projecting beyond said vertical edges thereof; a second pair of sleeves on opposite extremities of said second support member fixedly secured to said screen and projecting beyond said vertical edges in substantially vertical alignment with said first pair of sleeves; extensible bracing means secured to each of said sleeves for supporting said members at said extremities only, said bracing means being adjustable in height for tensioning said screen in vertical direction by displacing said first pair of sleeves away from said second pair of sleeves; and control means traversing each of said tubular support members in engagement with the respective pair of sleeves thereof for varying their relative spacing, thereby tensioning said screen along said longitudinal edges in horizontal direction.

References Cited by the Examiner

UNITED STATES PATENTS

798,181	8/1905	Bock	160—378
1,042,284	10/1912	Schenk	160—378 X
1,222,805	4/1917	Schmid	160—19
1,546,400	7/1925	Nichols	160—328 X
1,776,342	9/1930	Weinland	160—239
1,800,627	4/1931	Heck	160—24
2,197,489	4/1940	Trulock	160—378
2,411,131	11/1946	Hanson	160—24
2,403,661	7/1946	Hurley	160—328
2,527,816	10/1950	Herlache	160—24
2,922,471	1/1960	Nicholas	160—24
2,964,106	12/1960	Nicholas	160—24
3,048,220	8/1962	Wagner et al.	160—328

CHARLES E. O'CONNELL, *Primary Examiner*.

LAWRENCE CHARLES, REINALDO P. MACHADO,
HARRISON R. MOSELEY, *Examiners*.

D. L. TAYLOR, *Assistant Examiner*.