

May 21, 1940.

H. CARLSON

2,201,473

DETACHABLE SCANNING DRUM

Original Filed April 8, 1938

2 Sheets Sheet 1

FIG. 6

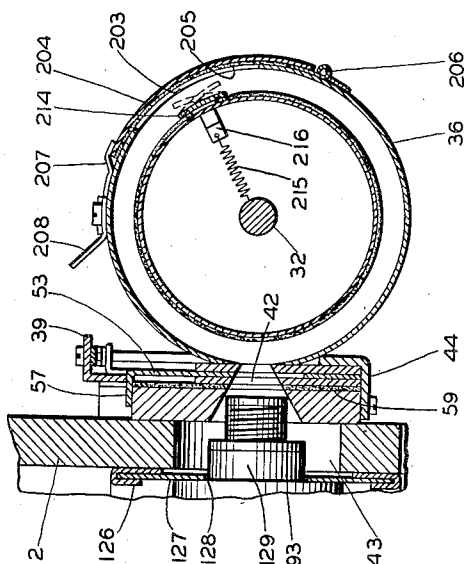
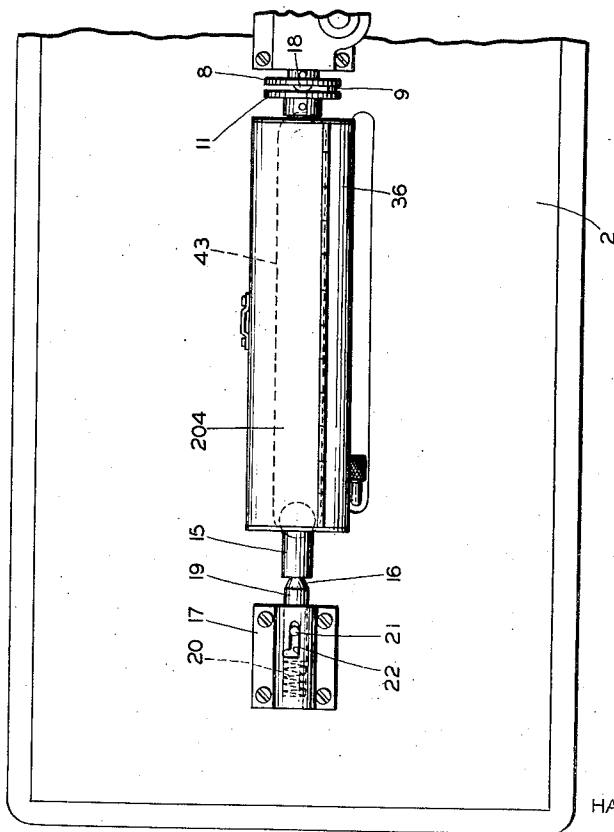


FIG. 1



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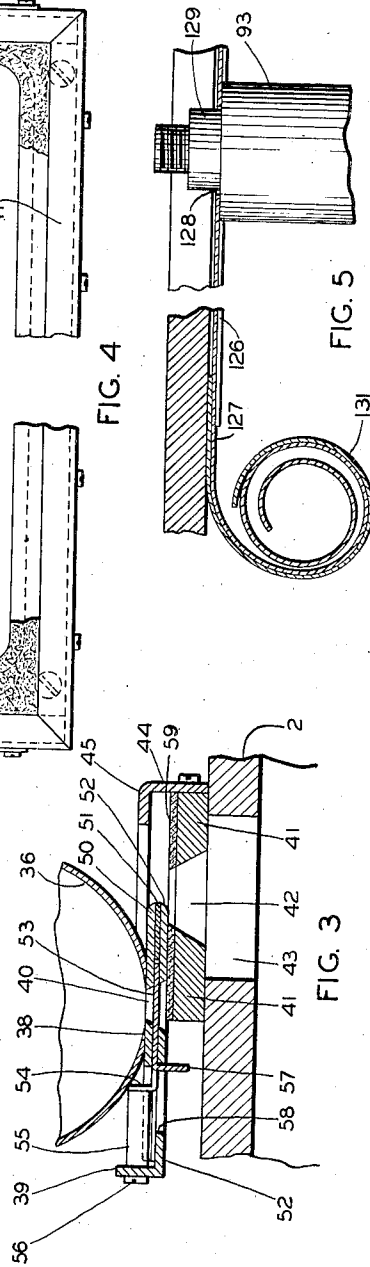
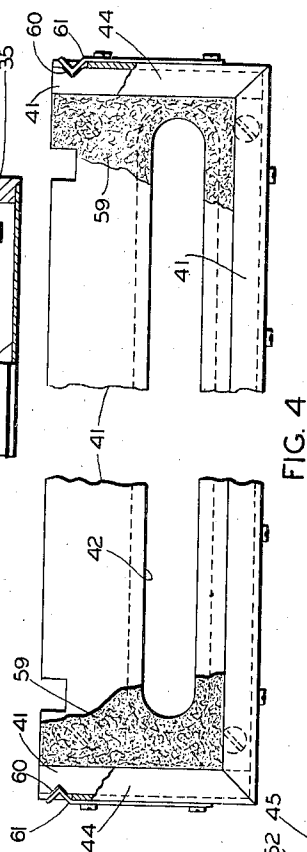
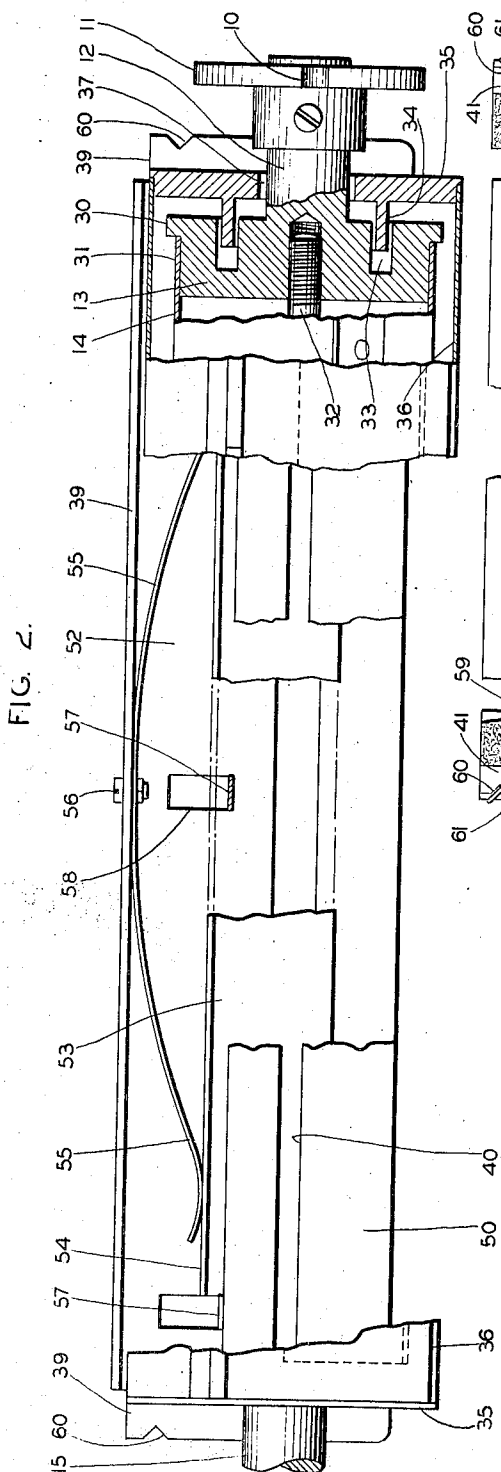
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2 Sheets-Sheet 2



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2,201,473

DETACHABLE SCANNING DRUM

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Original application April 8, 1938, Serial No.
200,895. Divided and this application February
25, 1939, Serial No. 258,401

16 Claims. (Cl. 178—6.7)

This application is a division of application Ser. No. 200,895, filed April 8, 1938.

This invention relates to a detachable scanning drum for picture transmission apparatus.

5 An object of the invention is the provision of a light proof scanning drum for supporting a sheet of sensitized material for picture scanning purposes which may be inserted or removed easily from a picture transmission apparatus without the danger of accidental exposure of the sensi-
10 tized material.

Other objects will appear in the accompanying description, given with the aid of the accompanying drawings, of which

15 Figure 1 is a plan view of part of a facsimile receiver;

Figure 2 is a plan view, partly in section, showing details of a scanning drum and its cover;

20 Figures 3 and 6 are vertical sections taken through the scanning drum and its cover, and showing also, details of the shutter mechanism;

Figure 4 shows details of the guideway on the upper surface of the base which retains the scanning drum cover;

25 Figure 5 shows in section the curtain for covering the slot in the base, together with part of the optical system.

30 Copending application Ser. No. 200,895 of which the present application is a division, discloses a facsimile receiver in which a motor drives through appropriate gears a lead screw located beneath a supporting base, for the purpose of causing longitudinal movement of a scanning light located beneath the base in fixed relationship with means for supporting and turning a scanning drum located on the upper side of the base.

35 In the present embodiment, novel means are disclosed which make it possible to remove from the machine and insert light tight scanning drums which are provided with a novel automatic shutter which makes accidental exposure of the sensitized sheet on the drum impossible.

40 Referring to Figure 1. At one end of a shaft, driven by a motor, not shown, is secured a disc 8 provided with a pin 9 adapted to enter a slot 10 in a second disc 11 secured to shaft 12 formed integrally with flanged end piece 13 of a hollow scanning cylinder 14, Figure 2, the cylinder being provided at its opposite end with a second end piece similar to 13 which is integral with shaft 15, the latter being spotted or countersunk at both ends in order that the cylinder may be
45 rotatably supported between the center 16 of tail-

stock 17, and 18 which together with disc 8 is turned by the driving motor.

Tailstock 17 consists of a bracket secured to the base provided with an opening in which spindle 19 is free to reciprocate. A compression spring 20 presses the spindle toward shaft 15, while pin 21 which projects through an L-shaped opening 22 in the bracket is used to retract manually the spindle when a drum is being removed or inserted.

5 Cylinder 14 is provided with a light proof casing of novel design which permits the use of highly sensitive film in the device under ordinary office lighting conditions, a dark room being necessary only for loading and unloading the film from the detachable cylinder assembly. Furthermore the invention provides for an auto-
10 matically operating shutter in the cylinder casing, which makes it impossible to expose accidentally the sensitized material when a cylinder is being removed or inserted into the machine.

20 Referring particularly to Figure 2 which is a plan view of the cylinder casing and the cylinder, partly in section:

End pieces 13 of the cylinder are provided with flanges 30 held against the ends of a metal tube 31 by threaded rod 32.

A deep annular recess 33 is cut into each end-piece, and into this recess extends ring 34 formed integrally with the ends 35 of cylinder casing 36. In each end of the casing is an opening 37 through which shafts 12 and 15 project which makes it possible to rotatably support the cylinder while the casing remains stationary. The arrangement just described provides a light trap at each end of the cylinder casing, which is desirable since opening 37 is appreciably larger than the diameter of shafts 12 and 15 to provide clearance when operating, and to make it easier to attach or remove the drum from its rotary supports.

40 At the bottom of the casing is a longitudinal slot 38 extending the length of cylinder 14. Casing 36 has a base 39 provided with a longitudinal slot 40 coinciding with slot 38. Base 39 fits over a supporting member 41 provided with a slot 42, (Figures 3 and 4) overlying an opening 43 in base 2.

Guides, composed of angle strips 44 are secured to three sides of support 41, the fourth side being open to permit base 39 to slide under the turned over part 45 of the guide strips.

50 Referring to Figures 2 and 3. Casing base 39 is shown composed of three strips of metal 50, 51 and 52 secured to each other and also to casing 36. The metal strip 51, however, is cut away for

some distance beyond slot 40 on three sides, and the fourth side which will overlie the part of support member 41 to the left of the drawings in Figure 3 is completely cut away for a distance somewhat greater than the length of slot 40 which provides a recess between strips 50 and 52 into which slides a shutter 53 which when closed renders light proof the part of the casing just referred to.

Shutter 53 is provided with a turned up edge 54 engaged by spring 55 secured to screw 56 to base 39, the spring tending to keep the shutter in the closed position as shown in Figure 3. The shutter also has a series of ears 57 extending downwardly through slots 58 in base strip 52, so located as to engage one edge of support member 41 and cause the shutter to withdraw, Figure 6, against the pressure of spring 55 and open slot 40 when a cylinder is properly positioned in the machine. Likewise, after a scanning operation has been completed, spring 55 closes the shutter as the cylinder assembly is removed from the guides. With this arrangement it is impossible to accidentally fail to open the shutter or to cause an undesired opening of the shutter. The upper surface of support 41 is covered with felt 59 to ensure a light proof connection between the cylinder cover and base 2.

The casing is retained in position by means of notches 60, Figure 2, in each end of base 39 which are engaged by detent springs 61, Figure 4, secured to angle pieces 44.

Referring to Figures 5 and 6: A metal strip 126 of J-shaped cross section is secured underneath base 2 on each side of slot 43. These strips extend beyond the ends of the slot and serve as guides for a light tight curtain which consists of a thin strip of bronze 127 having an opening 128 through which a tube 129 carrying the adjustable objective of optical system 33 extends. The length of shutter 127 is such that slot 43 is always covered, irrespective of the position of the optical system in the slot. Beyond the ends of guides 126, curved strips of flat metal, 130 and 131 are secured. The thin springy curtain metal 127 is set or strained so as to curl up in either 130 or 131, winding up in one and unwinding in the other as the optical system travels along the slot. A scanning light is projected by the optical system onto the film carried by the cylinder as described in application Ser. No. 200,895 referred to above.

The upper part of casing 36 has a longitudinal opening extending the length of cylinder 14 for the purpose of removing and inserting film. The opening is provided with a curved cover 204 lined with felt 205 and hinged to the casing by hinge 206. The cover overlaps opening 203 and the edge 207 is retained when the cover is closed by lock 208. The lock is formed of a metal strip attached to casing 36 by shoulder screw 209 which extends through an elongated hole in the piece 208 permitting a limited sliding movement of the strip.

Sensitized sheet 213 is held in place on the cylinder by retaining strip 214 which extends the length of the cylinder. The retaining strip is held in place by means of springs 215 fastened between shaft 32 and studs 216 secured to strip 214. A loading tool, not shown, having bifurcated arms to the ends of which are secured small pins which fit openings in the retaining strip is used to tilt the strip sideways in either direction for the purpose of removing or inserting film.

The device operates as follows: Assume that

the machine has been in operation and that a picture has been received. In order to remove the cylinder bearing the exposed film from the machine, plunger 19 is retracted against the tension of spring 20 by means of pin 21 which is given a partial turn in its L-shaped slot 22 thus holding plunger 19 in its retracted position.

While the casing is still in position, there is now sufficient end play for shaft 15 to permit slot 10 in disc 11 to be disengaged from pin 9 carried by disc 8. The casing may now be removed by sliding the same toward the left of the drawings (Figures 3 and 6). As the casing is drawn from its guides, but before it is completely removed, the depending lips 57 of the shutter become disengaged from support 41, as shown in Figure 3 and the shutter is closed by spring 55.

On inserting a new scanning roller, the casing is slid into position in guides 44. As the casing approaches operating position, ears 57 engage support 41 and open the shutter. The slot 10 in disc 11 is then positioned over pin 9 and the countersunk ends of shafts 12 and 15 are aligned with centers 16 and 18, and thereafter plunger 19 is released to engage the end of shaft 15. The drum is now supported between centers 16 and 18, and is free to turn clear of the casing, and the machine is ready for the next scanning operation.

What is claimed is:

1. In a device for permitting facsimile reception on a highly sensitive photographic film under ordinary office lighting conditions, a scanning cylinder to which a photographic film is secured, a casing for said cylinder, a longitudinal aperture in said casing through which said film may be exposed, a guideway for holding said casing during exposure operation, a spring controlled shutter normally closed, means connected with said shutter to cause the opening thereof on insertion into said guideway, said spring being effective to close said shutter before said casing is completely removed from said guideway.

2. In a device for permitting facsimile reception on a highly sensitive photographic film under ordinary office lighting conditions, a scanning cylinder to which a photographic film is secured, a casing for said cylinder, a longitudinal aperture in said casing through which said film may be exposed, a shutter for said aperture normally closed except during exposure operation, and a second aperture through which exposed film may be removed from the cylinder and new film inserted.

3. In a device for permitting facsimile reception on a highly sensitive photographic film under ordinary office lighting conditions, a scanning cylinder to which a photographic film may be secured, a casing for said cylinder, a longitudinal aperture in said casing through which said film may be exposed, a shutter for said aperture normally closed except during exposure operations, a second aperture normally closed by a hinged cover through which exposed film may be removed from the cylinder and new film inserted, the latter operation being performed under dark room conditions.

4. In a device of the character described, a scanning cylinder, a casing therefor, a light tight aperture in said casing through which exposed film may be removed from the cylinder and new film inserted and a second aperture having an automatic shutter through which a scanning ray is projected.

5. A detachable scanning drum comprising a hollow tube, end pieces for said tube having deep annular recesses concentrically disposed in respect to the axis of the tube, a cylindrical casing for said tube, an opening at each end of said casing through which shafts integral with said end pieces extend, rings concentrically disposed with said openings and integral with the ends of said tube extending into said recesses whereby a light trap is formed between the openings at the ends of the casing and the surface of the hollow tube.

6. A detachable scanning drum and a casing therefor, means for retaining said drum and casing in working position, and a light tight shutter in said casing which opens automatically when said drum and casing are being positioned in said retaining means, and which closes automatically when said drum and casing are being removed from said retaining means.

7. A detachable scanning drum and a casing therefore, means for retaining said drum and casing in working position, a light tight shutter in said casing which opens automatically when said drum and casing are being positioned in said retaining means, and which closes automatically when said drum and casing are being removed from said retaining means, and a second opening in said casing through which sensitized material for said drum can be changed.

8. A detachable scanning drum comprising a hollow tube, end pieces for said tube having deep annular recesses concentrically disposed in respect to the axis of the tube, a cylindrical casing for said tube, an opening at each end of said casing through which shafts integral with said end pieces extend, rings concentrically disposed with said openings and integral with the ends of said tube extending into said recesses whereby a light trap is formed between the openings at the ends of the casing and the surface of the tube; a light tight shutter in said casing which opens automatically when said drum is placed in operating position, said shutter being adapted to close automatically as the drum is removed from operating position.

9. In a detachable scanning drum having a light proof casing, a longitudinal opening in said casing through which may be projected a scanning light, a shutter guide associated with said opening, a shutter disposed in said guide, and yielding means effective to retain said shutter in position to cover said opening.

10. The combination of a detachable scanning drum, a light proof casing therefor, a longitudinal scanning aperture in said casing, a shutter adapted to move edgewise to cover said aperture, and means tending to move said shutter to close said aperture.

11. The combination of a detachable scanning drum, a light proof casing therefor, a longitudinal scanning aperture in said casing, a shutter for said aperture, and spring means effective to move said shutter in an edgewise direction.

12. The combination of a detachable scanning drum, a light proof casing therefor, a scanning aperture in said casing, a shutter for said aperture, a guideway for said shutter on said casing, and spring means tending to close said shutter.

13. The combination of a detachable scanning drum, a light proof casing therefor, a scanning aperture in said casing, a shutter for said aperture and a member extending from said shutter arranged to engage a support for said casing as the casing is placed in operating position and to thereby open the shutter.

14. The combination of a detachable scanning drum, a light proof casing therefor, a scanning aperture in said casing, a shutter for said aperture, spring means tending to retain said shutter in a closed position, and a member extending from said shutter arranged to engage a part secured to a base for supporting said casing as the casing is placed in operating position and to thereby open said shutter.

15. A detachable scanning drum comprising a cylinder, a shaft extending from each end of the cylinder, deep annular recesses in the ends of said cylinder concentrically located in respect to the axis thereof, a light proof casing for said cylinder having loose fitting openings through which the respective ends of said shaft project, rings projecting inwardly from the adjacent ends of the casing into the annular recesses at the ends of the cylinder whereby a light trap is formed between the openings in the casing for the shaft and the surface of the cylinder.

16. The combination of a detachable scanning drum, a light proof casing therefor, shaft means for supporting said drum, loosely fitting openings in said casing through which said shaft means extend, and a light trap to prevent light admitted through said openings from reaching the cylindrical surface of the drum.

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