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MEANS AND METHOD FOR STORING AND DISPENSING RADIOGRAPHIC FILMS

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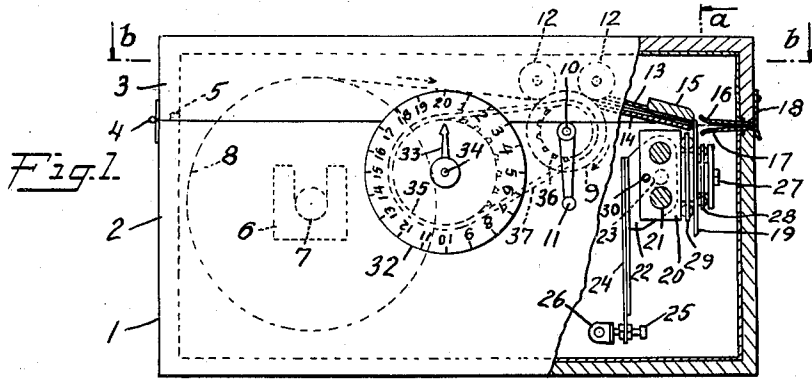


Fig. 2.

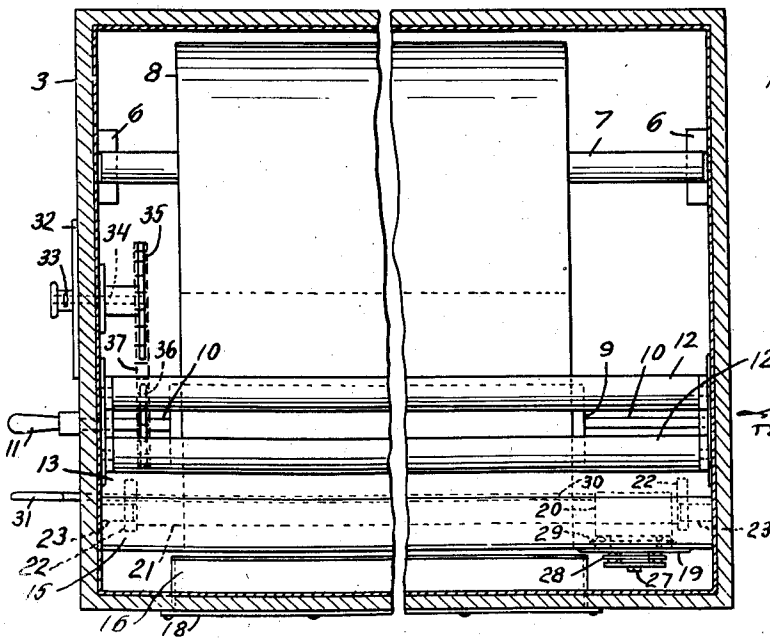
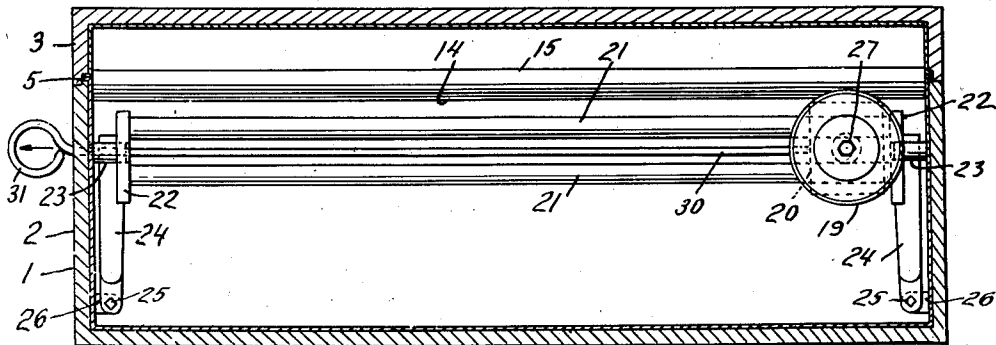


Fig. 3.

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MEANS AND METHOD FOR STORING AND DISPENSING RADIOGRAPHIC FILMS

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22 Claims. (Cl. 164-42)

My invention relates to dispensing devices and particularly to a device for dispensing sensitized membrane, such as the film or paper used in the making of radiographs with X-rays or gamma rays, or the like.

The objects of my invention are to provide a simple, convenient and quickly operable device for storing and dispensing the sensitized membrane used in the radiographic art, by means of which the operator may provide himself with a sheet of sensitive medium of the particular size desired, and to permit the packing, sale, purchase and use of the sensitive medium as a continuous strip in the form of rolls instead of cut sheets, and by so doing materially reduce the cost of the sensitive medium.

Heretofore it has been the practice to use sensitive membranes for radiographs in the form of cut sheets and as a variety of sizes are used for different purposes, it is necessary for the radiographer to keep a stock of cut sheets of each of the sizes commonly used. The most popular sizes are 5 x 7, 7 x 9, 8 x 10, 10 x 12, 11 x 14 and 14 x 17 inches. To be prepared to meet any size requirements a stock of each of these and perhaps of other sizes needs to be kept on hand. If some of the sizes are used but infrequently the stock may deteriorate with age and becomes useless. These cut sheets are commonly packed in cardboard boxes containing one dozen or six dozen sheets. These boxes must be of high quality, well made, and perfectly light tight to properly protect the contents. In addition to the box container the sheets are carefully wrapped in waxed paper and an opaque paper, and sometimes placed each in separate envelopes for additional protection. Such packing as has heretofore been common is expensive and constitutes no inconsiderable item in the total cost of the product. In addition to this there is the cost of cutting the medium into sheets and counting out and separately packaging them.

Another inconvenience of the present methods lies in the fact that each time that a sheet of the sensitive membrane is desired for use, the light tight container is opened, the inner wrapping removed, the sheet taken out and the balance of the sheets re-wrapped and returned to the container in order to keep them safely protected from fogging by exposure to light. All of these operations are time consuming and are eliminated by my new device.

By the use of my new dispensing device, the sensitive medium may be put up by the manufacturer in rolls, just as it comes from the coating

machine which applies the sensitive coating to the membrane, and without any cutting into separate sheets or any packing of sheets in expensive containers, as described above. These rolls of varying width and any desired length, such for example as fifty feet, or one, two or three hundred feet, may be covered by a light tight wrapping and sold and delivered in that form. The user merely places the roll in my dispensing device in the dark room, in which it is to be used, and measures off from the end of the roll of membrane such length as is desired, cuts it off and places it in the cassette for exposure.

By providing three widths of rolls of the sensitive membrane, for example 7", 10" and 14" wide, sheets may be cut to any of the popular sizes mentioned above, the 5 x 7 and 7 x 9 size being cut from the 7" roll, the 8 x 10" and 10 x 12" sizes from the 10" roll, and the 11 x 14 and 14 x 17" sizes from the 14-inch roll.

This simplified packing materially reduces the cost of the sensitized membrane to the consumer and by carrying in stock two or three rolls of varying width the operator may cut off the size of sheet desired. Instead of opening, unwrapping, re-wrapping and returning to the container the cut sheets, the operator merely measures out the desired length of the strip of membrane from the roll of the proper width, cuts it off and immediately uses it. The balance of the roll of membrane is always securely and safely protected from the light without any attention or manipulation on the part of the operator. The consequent saving in time is a material item in a busy radiographic laboratory.

My invention may find application in a variety of forms. I show in the accompanying drawing and hereinafter describe a form which I prefer. In this drawing like members indicate the same or similar parts and arrows indicate the direction of motion or rotation.

Fig. 1 is an end view partly in section of one form of apparatus with portions shown as cut away to more clearly reveal interior parts.

Fig. 2 is a vertical sectional view on the line aa. Fig. 3 is a horizontal sectional view on the line bb.

In Fig. 1 I have shown a box or receptacle 1, consisting of a lower portion, 2, and a lid or cover, 3, connected by hinges 4, to the lower portion. The interior of the box may be provided, if desired, with a member for excluding X-rays, and as shown the box has a lead lining 2^a. This can be used in the absence of other safeguards against disturbing X-ray action, but need not be used

when there are other adequate safeguards. To exclude light rays only, the cover and lower portion are so constructed that no light can pass at their surfaces of contact, 5.

5 Within this case I provide shaft receptacles, 6, one at each end of the box, for receiving a shaft, 7, upon which may be placed a roll, 8, of the sensitive membrane to be dispensed.

Parallel with shaft 7 is suitably mounted in 10 bearings a measuring roller, 9, provided with a shaft, 10, one end of which projects through the end of the receptacle and is provided with a hand crank 11, by means of which the measuring roller may be rotated from without the receptacle. 15 Suitably mounted in bearings attached to the cover portion of the receptacle are two pressure rollers, 12, which are so positioned as to press firmly against the measuring roller 8, when the receptacle is closed.

20 Adjacent and parallel to the measuring roll is a pair of guide plates composed of an upper plate, 13, and a lower plate, 14, spaced apart and converging in a manner adapted to receive the strip of membrane as it passes the measuring roller, 8, 25 and guide it and position it in reference to the knife blade, 15. Adjacent and parallel to the knife blade 15 is a second pair of guide plates composed of an upper plate 16 which is attached to the cover portion of the receptacle 1 and a 30 lower plate 17, which is attached to the lower portion of the receptacle. These two guide plates are so positioned that when the receptacle is closed they converge toward the exterior of the receptacle in a manner adapted to receive the mem- 35 brane as it passes the knife blade 15 and guide it through the narrow slot formed by the two guide plates to the exterior of the receptacle. Attached to the cover, 3, of the receptacle is a flap, 18, of soft, flexible, opaque fabric, such as felt, 40 which serves to cover the narrow slot formed by the guide plates 16 and 17, and so exclude light from the interior of the receptacle. The flexibility of this flap, 18, permits the membrane to displace it as the membrane emerges from the recep- 45 tacle through the slot.

Within the receptacle 1 is mounted a cut-off device, which I prefer to be of the rotary disc knife type shown in the drawing, but which may be of other well known types. This cut-off device 50 consists of a disc knife, 19, mounted on a carriage, 20, which slides freely on two parallel guide rods, 21. These guide rods are attached to end blocks, 22, which are pivoted on studs, 23, mounted on the inside of the receptacle, 1. Attached to each of 55 the end blocks, 22, are leaf springs, 24, provided with adjusting screws, 25, contacting with lugs, 26, attached to the inside of the receptacle, 1.

By means of these adjusting screws the pressure of the disc knife, 19, against the knife blade, 60 15, may be controlled and varied. The disc knife, 19, is mounted on the carriage, 20, by means of the screw bolt, 27, and friction is largely eliminated by two ball thrust bearings, 28 and 29, one on either side of the disc knife, 19. As a means of 65 moving the disc knife assembly along the knife blade, 15, a pull rod, 30, is attached to the carriage, 20, and extends through an opening on one end of the receptacle and is provided with a suitable handle or ring, 31, so arranged that by move- 70 ment of this rod the carriage, 20, carrying the disc knife, 19, may be caused to traverse the length of the receptacle and so sever the membrane on the line of contact between the disc knife and the knife blade. Attached to the outside of the re- 75 ceptacle is a dial, 32, graduated in inches. Co-

operating with the dial is a pointer, 33, movably mounted on a shaft, 34, which passes through the centre of the dial, 32, and through the wall of the receptacle and has rigidly mounted on its inner end a chain sprocket, 35. Upon the shaft, 10, of 5 the measuring roll, 9, is rigidly mounted a chain sprocket, 36. A chain, 37, operatively connects sprockets 35 and 36, which are of such relative size that the lineal movement in inches of the periphery of the measuring roll, 9, is accurately indicated by the pointer, 33, on the dial, 32. 10 By means of the movable mounting of the pointer, 33, on the shaft, 34, the pointer may be turned to the zero point on the scale each time the dispenser is used. 15

Having described the construction of a preferred form of my device, I will now describe the manner of its operation.

A roll of sensitive membrane is placed upon the shaft, 7, and the shaft placed in the shaft 20 receptacles, 6, and the outer or loose end of the membrane is passed in the direction of the arrow over the measuring roll, 9, and between it and the pressure rollers, 12, and between the guide plates, 13 and 14, and to a point beyond the cutting edge 25 of the knife blade, 15. The receptacle is closed and by means of the pull rod, 31, the disc knife, 19, is caused to traverse the length of the knife blade, 15, and sever the membrane at the line of contact. Having thus squared up and trimmed 30 the end of the strip of membrane and having removed the piece of membrane so severed, the pointer, 33, is set at zero on the dial, 32, and the crank, 11, is turned in the direction of the arrow until the pointer, 33, actuated by means of the 35 sprockets, 35 and 36 and the chain 37 indicates on the dial, 32, that the exact number of inches of membrane desired by the operator have passed over the measuring roll, 9, and advanced past the cutting edge of the knife blade, 15. The disc knife 40 is then caused to traverse the knife blade, 15, by means of the pull rod and by so doing to sever the membrane at the line of contact.

The severed portion of the membrane is removed from between the guide plates 16 and 17, 45 the operation is completed, and the measured membrane is ready for use.

It will be evident from the above description of the device and of its operation that cut sheets of any exact length desired may be made avail- 50 able from the supply roll within the receptacle, without danger of exposure to light or rays in a minimum of time and with a minimum of effect.

Having described my invention and shown and described a preferred embodiment thereof, I will now state what I believe to be new and novel, and for which I pray that Letters Patent be granted. 55

I claim:

1. As an article of commerce, a device for stor- 60 ing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, means for dispensably supporting a supply of strip membrane therewithin, means operable from the exterior of said casing for measuring from 65 said supply a desired length of membrane, means viewable from without the casing for indicating said desired length of membrane, and means operable from without the casing for cutting off the desired strip of membrane. 70

2. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, means for rotatably supporting a roll of mem- 75 brane therewithin, means operable for the exter-

ior of said casing for unrolling from said roll a desired length of membrane, means viewable from without the casing for indicating said desired length of unrolled membrane, and means operable from without the casing for cutting off said desired length of unrolled membrane.

3. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, means for dispensably supporting a supply of strip membrane therewithin, means operable from the exterior of said casing for measuring from said supply a desired length of membrane, means viewable from without the casing for indicating said desired length of membrane, and means for cutting off the desired strip of membrane within the casing.

4. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, means for dispensably supporting a supply of strip membrane therewithin, means operable from the exterior of said casing for measuring within the casing a desired length of membrane, means viewable from without the casing for indicating said desired length of membrane, means for cutting off the desired strip of membrane within the casing, and means for delivering the cut off membrane from the ray-excluding casing.

5. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, a support for a roll of sensitive membrane within the casing, a cutter within the casing, means for unrolling a desired length of strip past the cutter, means viewable from without the casing for indicating said unrolled length, and means for operating the cutter in cutting off said unrolled length.

6. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, a support for a roll of sensitive membrane within the casing, a cutter within the casing, means for unrolling a desired length of strip past the cutter, means viewable from without the casing for indicating said unrolled length, and means operable from without the casing for operating the cutter in cutting off said unrolled length.

7. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, a support for a roll of sensitive membrane within the casing, a cutter within the casing, means for unrolling a desired length of strip past the cutter, means viewable from without the casing for indicating said unrolled length, and means for cutting off said unrolled length within said casing.

8. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, a support for a roll of sensitive membrane within the casing, a cutter within the casing, means for unrolling a desired length of strip past the cutter, means viewable from without the casing for indicating said unrolled length, means for cutting off said unrolled length and means for delivering said cut off length from the casing.

9. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, means for dispensably supporting a supply of strip membrane therewithin, devices operable from without the casing for measuring and severing a desired length of membrane and

means for delivering the severed strip without affecting the ray-excluding condition.

10. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination means whereon rolls of membrane of various widths may be supported, means operable from the exterior of said casing for unrolling within the casing a desired length of membrane irrespective of its width, means viewable from without the casing for indicating said desired length of unrolled membrane, and means operable from without the casing for cutting off said desired length of membrane.

11. As an article of commerce, a device for storing and dispensing ray sensitive strip membrane, including in combination a ray-excluding casing, means for dispensably supporting a supply of strip membrane therewithin, means operable from without the casing for measuring a desired length of membrane and projecting the end of the measured strip from the casing through a normally sealed opening, and means operable from without the casing for cutting off the desired length of membrane strip.

12. A device for storing rolled ray-sensitive strip membrane and capacitated to dispense from a single roll a plurality of standard sizes of cut films, including in combination a casing, means for rotatably mounting a roll of membrane within the casing, means operable from the exterior of the casing for unwinding and measuring a variable desired length of said membrane, means viewable from without the casing for indicating said desired length of membrane and means operable from without the casing for cutting off the desired length of membrane in a position where it is accessible for withdrawal from without the casing.

13. A device for storing rolled ray-sensitive strip membrane and capacitated to dispense from a single roll a plurality of standard sizes of cut films, including in combination a casing, means within the casing for rotatably mounting membrane rolls of different widths, means operable from the exterior of the casing for unwinding and measuring variable desired lengths of said membrane, means viewable from without the casing for indicating said desired length of membrane, and means operable from without the casing for cutting off the desired length of membrane in a position where it is accessible for withdrawal from the casing.

14. A device for storing rolled ray-sensitive strip membrane and capacitated to dispense from a single roll a plurality of standard sizes of cut films, including in combination a casing, means within the casing for rotatably mounting membrane rolls of different widths, means operable from the exterior of the casing for unwinding and measuring variable desired lengths of said membrane and settable by the operator in relation with the particular width of membrane roll used to alternatively measure off either a long or short dimension of a desired cut film, means viewable from without the casing for indicating said desired measured length of membrane, means operable from without the casing for cutting off the desired length of membrane and means permitting the withdrawal of the cut-off membrane from the casing.

15. A device for storing rolled ray-sensitive strip membrane and capacitated to dispense from a single roll a plurality of standard sizes of cut film, including in combination a casing, means

within the casing for interchangeably receiving and rotatably supporting any one of a plurality of membrane rolls of different widths, the various widths having definite relation to the standard sizes of cut films, means operable from the exterior of the casing for unwinding and measuring variable desired lengths of said membrane and settable by the operator in relation with the particular width of membrane roll used to alternatively measure off either a long or short dimension of a cut film, means viewable from without the casing for indicating said desired measured length of membrane, means operable without the casing for cutting off the desired length of membrane and means permitting the withdrawal of the cut-off membrane from the casing.

16. A device for storing ray-sensitive strip membrane and capacitated to dispense from a single roll a plurality of desired sizes of cut films, including in combination a casing, means within the casing for interchangeably receiving and rotatably supporting any one of a plurality of membrane rolls of different widths, the various widths having a definite relation to the desired sizes of cut films, means for unwinding and measuring variable desired lengths of said membrane and settable by the operator in relation with the particular width of membrane roll used to measure the other dimension of the desired cut film, measure-indicating means, and means for cutting off the measured and indicated length of strip membrane.

17. The method of deriving a relatively large number of standard sizes of cut radiographic films from a relatively few sources of radiographic film strip, which comprises selecting a relatively small number of supply sources of radiographic film strips of different widths, which widths have definite relations to the sizes of film sheets to be cut off, selecting a film strip source because of dimensional relation of its width to a desired size of cut film, withdrawing a length of film corresponding to the other dimension of the desired film sheet and severing said length of film sheet and withdrawing it from the supply.

18. The method of deriving a relatively large number of sizes of cut radiographic films from a relatively few sources of rolled radiographic film strip which comprises selecting a relatively small number of rolls of radiographic film of different widths, said widths varying in definite relations to desired sizes of film to be cut off, unrolling

from a roll selected because of dimensional relation of its width to one dimension of a desired size of cut film a length of film representing the other dimension of the desired cut film, and severing said length of film from the roll.

19. The method of deriving a relatively large number of sizes of cut radiographic films from a relatively few sources of ray-protected rolled radiographic film strip, which comprises unrolling from a selected one of a plurality of rolls a length corresponding to either the length or width of a standard size of cut film, the other dimension of cut film being the width of the roll, cutting off said measured length and removing it from the protective means.

20. The method of deriving a relatively large number of standard sizes of cut radiographic films from a relatively few sources of radiographic film strip, which comprises selecting a relatively small number of supply sources of radiographic film strips of different widths, which widths have definite relations to the sizes of film sheets to be cut off, selecting a film strip source because of dimensional relation of its width to a desired size of cut film, withdrawing a length of film corresponding to the other dimension of the desired film sheet and severing said length of film sheet and withdrawing it from the supply.

21. The method of deriving a relatively large number of sizes of cut radiographic films from a relatively few sources of rolled radiographic film strip which comprises selecting a relatively small number of rolls of radiographic film of different widths, said widths varying in definite relations to desired sizes of film to be cut off, unrolling from a roll selected because of dimensional relation of its width to one dimension of a desired size of cut film a length of film representing the other dimension of the desired cut film, and severing said length of film from the roll.

22. The method of deriving a relatively large number of sizes of cut radiographic films from a relatively few sources of ray-protected roller radiographic film strip, which comprises unrolling from a selected one of a plurality of rolls a length corresponding to either the length or width of a standard size of cut film, the other dimension of cut film being the width of the roll, cutting off said measured length and removing it from the protective means.

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