July 24, 1934. F. T. POWERS 1,967,324

DISK SHEAR

Filed Jan. 28, 1932

Fig. 1.

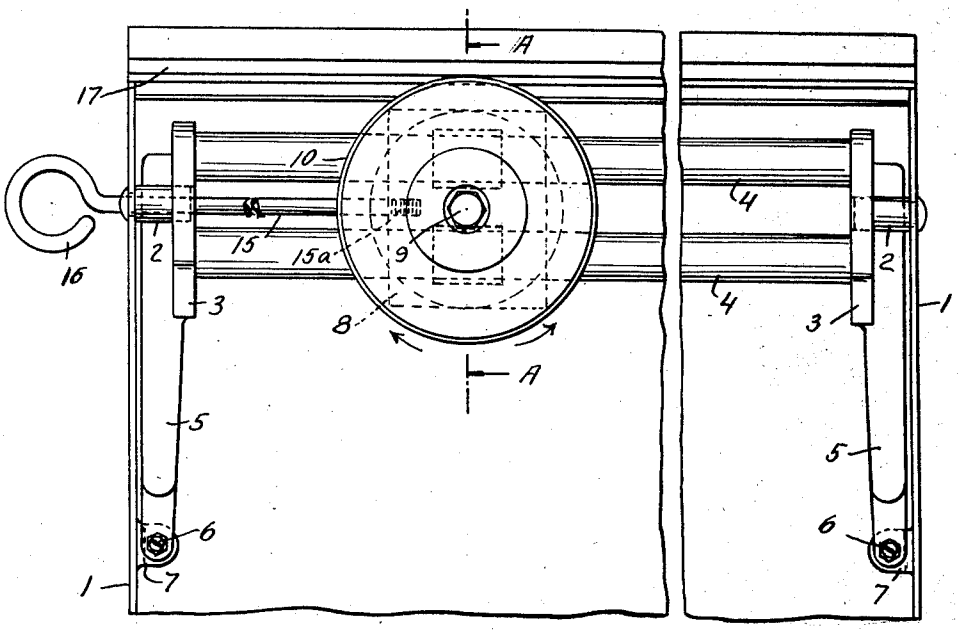


Fig. 2.

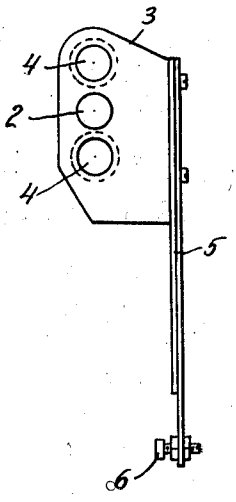
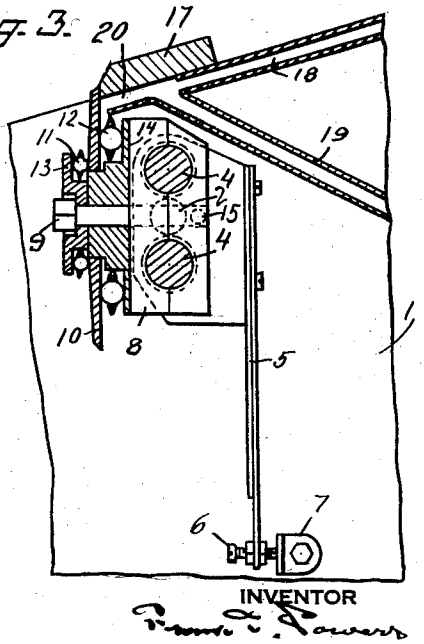


Fig. 3.



INVENTOR

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Patented July 24, 1934 1,967,324

UNITED STATES PATENT OFFICE

1,967,324

DISK SHEAR

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Application January 28, 1932, Serial No. 589,400

1 Claim. (Cl. 164—77)

My invention relates to rotary cutters and more particularly to an improved disk type of cutter, especially adapted for use in a roll camera of the sort indicated in applicant's copending application Serial Number 360,693 filed May 6, 1929, since issued as Patent No. 1,909,424.

The objects of my invention are to provide an improved cut off knife for cutting sensitized paper or other membraneous photographic material, and which will not produce lint or fine particles while severing the membrane, and also to provide a cut off device which will remain in satisfactory operating condition for long periods of time without regrinding or resharpening or other attention, and one which can be kept in accurate adjustment for best operating conditions.

In a photographic camera, such as is used in commercial process work, in which a rolled strip of sensitized membrane is commonly used, it is often desirable to sever the strip of membrane in the camera after each exposure, or after a series of exposures. The membrane used is usually a high grade calendered paper which requires a keen cutting edge operating against a rigid cutter plate to produce a clean cut without any ragged edges or detached small particles resulting.

It is particularly at preventing the production of any small detached or loose particles while cutting that my invention is aimed. With the old type of cutters, such as the thin steel draw knife, there results numerous fine detached particles of paper which frequently attach themselves to the surface of the membrane and cause fine spots in the resultant negative. But with my new type of rotary disk knife I produce a shearing action under accurately adjustable conditions of pressure of the rotating cutting edge against shear plate and of the angles of cutting edges which results in a clean cut without fraying or loose particles.

Such results can only be attained when the cooperating cutting edges are in proper adjustment, one with the other, and when the proper pressure exists between the two cutting edges. To provide the means for such proper adjustment of the two cutting edges and the means for maintaining the proper relationship for long periods of time are amongst the primary objects of my invention.

I have shown in the accompanying drawing a preferred embodiment of my invention, which is particularly adapted to use in conjunction with a process camera for severing strips of sensitized photographic media. In the drawing like characters indicate the same or similar parts and arrows indicate direction of motion or rotation.

Fig. 1 is a plan view of the device. Fig. 2 is an end view. Fig. 3 is a section on the line AA.

I will now describe both the construction of the preferred example of my apparatus and the method of its operation.

In Fig. 1 a portion of the camera case in which the device is housed is shown at 1. To opposite sides of this case 1 are attached two pivot members, 2, which engage holes in two rocker blocks, 3, which carry the ends of two round slide rods, 4. To each of the two rocker blocks, 3, are attached the leaf springs, 5, having adjusting screws, 6, which engage lugs, 7, attached to the camera case. Upon the two slide rods, 4, is mounted a split carriage block, 8, which with its cooperating parts is shown in detail in Fig. 3. The screw, 9, holds together the two halves of the carriage block, 8, and also holds the rotary disk knife, 10, the two ball bearing rings, 11 and 12, and the two ball race plates 13 and 14, so that the knife, 10, is free to rotate between two ball rings with a minimum of friction and, when the screw stud 9 is properly adjusted, without any play or lost motion. The split carriage block, 8, slides freely upon the two slide rods, 4, and may be moved to and fro along these rods by means of the handle rod, 15, which extends through one side of the camera case, 1, and terminates in a suitable handle or ring, 16. This handle rod, 15, has one end screwed into the hole 15A in the carriage block, 8.

Attached to the camera case, 1, and rigidly supported thereon, is a stationary knife blade, 17, of stiff construction. The blade, 17, is carefully and accurately adjusted so that its cutting edge is parallel with the slide rods, 4, so that the rotary disk knife, 10, will travel from one end to the other of the blade 17 with uniform pressure between the two knives. The pressure of the disk knife, 10, against the blade, 17, is adjusted by means of the adjusting screws, 6, by means of which the springs are flexed, tending to rotate the rocker blocks, 3, on the pivots, 2, to increase or decrease the pressure of the disk knife, 10, upon the cutting edge of the blade, 17.

The membrane to be sheared which in many instances is sensitized photographic paper, is fed past the shearing device through the narrow slot apertures 18 and 19, which converge and form one slot, 20, adjacent to the edge of the stationary knife, 17. Thus the membrane to be sheared may be fed to the shearing device through either slot 18 or slot 19. By suitable

movement of the rod, 15, the split block, 8, carrying with it the disk knife, 10, is caused to traverse the camera box from side to side, severing at the moving point of contact between the disk knife 10 and the stationary knife 17, the paper or other membrane which may at the time project from the slot, 20, beyond the cutting edge of the stationary knife, 17. The result is a clean, straight cut with smooth edges and no lint or detached particles of paper. By adjustment of the screws, 6, a proper pressure is maintained between the two cutting edges so that efficient cutting is always secured. The importance of the clean cutting and absence of loose particles is great, for the reason that every loose particle which lodges on the face of the photographic medium will produce a defect in the picture.

I claim:

A membrane shearing device of the disk knife type which is characterized by a pair of parallel slide rods having their opposite ends rigidly attached to rocker blocks pivoted to a frame midway between the ends of said rods, to which are attached spring members having accurate adjustments of their tension for yieldably rotating said rocker blocks and maintaining an even pressure of a rotatable disk knife slidably mounted on said rods against a stationary knife blade substantially as described.

FRANK T. POWERS.