Jan. 5, 1937. G. KUNZ 2,066,732

FILM CLIP

Filed Nov. 21, 1935

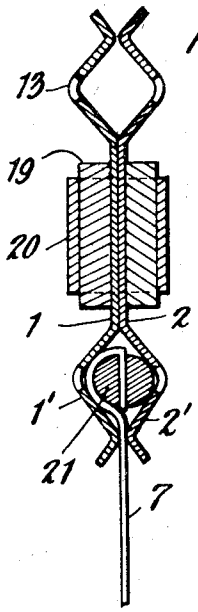


Fig.1.

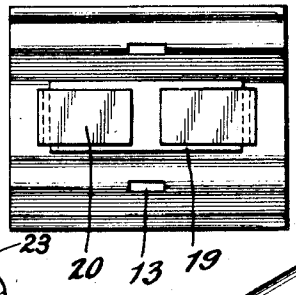


FIG.2

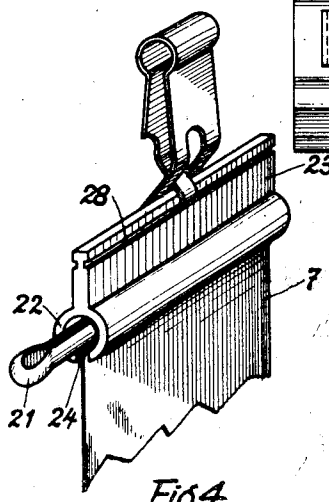


Fig.4.

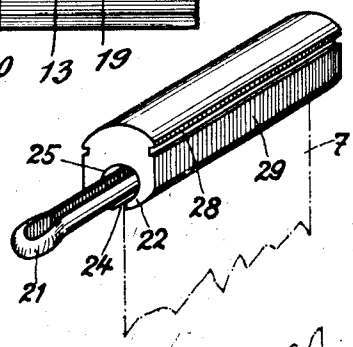


Fig.5.

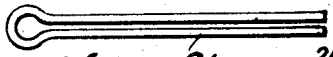


Fig.3.

Fig. 6.

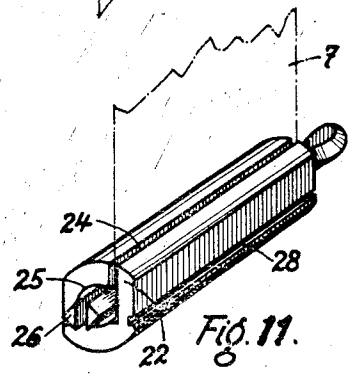


Fig. 11.

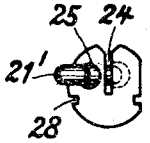


Fig.7.



Fig.8.

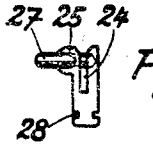


Fig. 9.



Fig.10.

Fig.12.

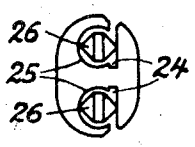
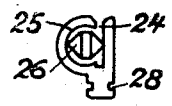


Fig.13.



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UNITED STATES PATENT OFFICE

2,066,732

FILM CLIP

Gottlieb Kunz, Villars-sur-Ollon, Switzerland

Application November 21, 1935, Serial No. 50,972
In Switzerland November 14, 1934

8 Claims. (Cl. 24—263)

This invention relates to clips for use in the developing, fixing and washing of photographic roll films, paper strips and the like of the kind comprising jaws at each end adapted to engage the film.

It is known, that films when suspended in the treating vessels must be weighted at their lower ends, in order that they do not roll up again. For that purpose, generally one of the clips serving for suspending the film is used, as this is the simplest and most convenient method to weight the films. The clips as hitherto known are relatively broad and require relatively much room. Therefore it is impossible to make the best use of the chemicals in the treating vessels.

The object of the present invention is a clip which is to avoid this disadvantage. The clip is of an extremely flat construction so that it requires a minimum of room. With regard to the clips hitherto employed, the number of films, which a given treating vessel can take up may be remarkably increased by utilizing the new clip. According to the present invention this clip is characterized in that it comprises one or two pairs of jaws, within which a bolting member is pressing one end of the film against one of the jaws by bearing upon the other jaw.

Some working examples of the object of the invention are shown in the accompanying drawing, in which:

Fig. 1 is a vertical cross sectional view of one form of the invention,

Fig. 2 is a side elevational view of the arrangement shown in Fig. 1,

Fig. 3 is a top plan detail,

Fig. 4 is a perspective detail of another form of the invention,

Fig. 5 is a perspective detail of a third or modified construction of the invention,

Fig. 6 is a perspective detail of a fourth form of the invention,

Fig. 7 is an end elevational detail of a fifth form of the invention,

Fig. 8 is a top plan view of the arrangement shown in Fig. 7,

Fig. 9 is an end elevational detail of a further form of the invention,

Fig. 10 is a plan view of the arrangement shown in Fig. 9,

Fig. 11 is a perspective view of a still further modified form of the invention, and

Figs. 12 and 13 are end elevational views of additional forms of the invention.

With regard to the three first figures, 1 and 2 are rectangular pieces of sheet metal, which are provided at two opposite edges with angular jaws 1' and 2' extending in a parallel direction to the latter. The two pieces of sheet metal are put one upon the other in such a way that the jaws of both parts are opposite of each other and form a longitudinal slot. The jaws 1' and 2' do not touch each other and are slightly bent outward, so that the film can easily be inserted.

The two elements 1 and 2 of the clip are held together by one single strip of sheet metal 20, which is crossing corresponding slots in the metal sheets 1 and 2. To strengthen the connection intermediate pieces 19 may be arranged on either side of the axis of the clip, whereby these intermediate pieces are clasped by the strip 20. The connection may, however, also be effected by means of rivets or screws.

The film is gripped by the aid of a split pin 21 (see Figs. 1 and 3). The pin 21 is introduced into the rectangular holes of the clip and turned in such a way that the slot, formed by the two members turned toward one another is opposite the slot of the jaws. The film is inserted between the jaws, whereby it is seized by the pin 21. By turning the latter the film is wound up and held fast in consequence of the pressure exerted by the jaws on the pin.

For suspending the clip described hereabove, slots 13 are provided in the middle of the jaws.

Without going beyond the bounds of the present invention, the jaws of the clip may also have any other shape such as for example a semi-circular form.

The clips represented in Figures 4–13 are manufactured of section bars of non ferrous metals, preferably of brass. Each of the clips is made of another section bar.

The profile of the clip according to Fig. 4 has the form of a tube slotted in a longitudinal direction and having a flat metal bar 23 attached thereto. The two semi-circular parts 22 of the tube constitute the jaws of the clip. In the longitudinal slot 24 a pin like clamping member 21 is rotatably and slidably arranged. For gripping a film 7 the two branches of the clamping member are turned in such a way that the longitudinal slot becomes free and that one end of the film can be inserted. Upon this the clamping member is rotated, whereby the film is gripped between the branches of this member and the jaws.

The clip according to Fig. 5 is made of a metal bar which comprises two oppositely situated surfaces 29 and an eccentric bore 25. The wall of the so formed cylinder is slotted at its thinnest place. The parts 22 on either side of the slot 24 constitute the jaws of the clip. The film is gripped in the same way as in the above mentioned working form by means of said clamping member 21.

The clip according to Fig. 6 is a double clip which is adapted to grip both ends of the film so that the latter may be suspended as a loop. The metal bar used for manufacturing this clip has substantially an oblong section and comprises two eccentric bores 25, each with a longi-

tudinal opening **24**, which are extended in the same direction as in the working example according to Fig. 5. The jaws **22** are therefore of the same shape as those of the latter clip.

In the working form according to Figs. 7 and 8 the bore **25** is extended in an acute angle to the slot **24**. The introduction of the clamping member, which is also constituted by a split pin **21'** is consequently limited by one of the walls of the slot **24**. One arm of the clamping member **21'** is somewhat shorter than the other, by which means this member can be introduced as deeply as possible into the slot **24**.

When a film is gripped in this clip, it is pressed against the wall of the slot **24** opposite the bore **25** by means of the clamping member **21'**, whereby the resilient branches of the latter bear tightly upon the wall of the bore. In consequence of the friction arising therefrom the clamping member **21'** is held fast in the bore.

Figs. 9 and 10 show a similar clip, which only differs from that just described by the cross section of the metal bar of which it is made, and by another constitution of the clamping member. The latter is formed here by a simple elastic pin **27**. The working method of this clip is just the same as in that of the foregoing example.

The clips represented by Figs. 11–13 are manufactured in a similar way as those according to Figs. 5 and 6, with the difference that they are made of different section bars and that the slot **24** has a tangential direction with respect to the bore **25**. As clamping member a quadrangular split pin **26** is provided, which, after introducing the film into the slot **24** is turned into the position represented in the Figs. 11–13, whereby the film is clamped between one of the edges of the member **26** and the opposite wall of the slot **24**. The clip according to Fig. 11 is shown as a weighting clip, and that according to Fig. 12 as a double clip.

All of the clips according to Figs. 4–13 are provided at two opposite places with a groove **28** which are adapted to be engaged with a clamp for suspending the clips (see Fig. 4).

As it may be noticed from Fig. 4–13 the jaws of all of these clips are of such a thickness that they are practically inelastic. The arms of the pinching members, however, are everywhere acting as a spring.

The clips according to Figs. 4–13 have the advantage that in consequence of their manufacture from section metal bars they are remarkably cheaper than the clips according to Figs. 1–3. The effect in view, which is to create a clip requiring the smallest possible room in the treating vessels, is thereby not influenced in any way.

What I claim is:

1. In a film clip provided with suspension means, the combination of a pair of jaws formed by a slotted metal bar provided with a slanting side bore extended into the slot and a resilient pin introduced into said slanting bore to clamp the film introduced between the jaws.

2. In a film clip, the combination of a metal clasp having jaws forming an internal bore, and a split pin rotatably mounted within and substantially filling said bore, one end of the film being adapted to pass through the slit in said pin, whereby when the pin is rotated a portion of the film will be wound about said pin and clamped between the latter and said jaws.

3. In a film clip, the combination of a solid metal bar having jaws forming an internal bore, said jaws being spaced apart at their free ends to provide a slot therebetween, and a split pin rotatably mounted within and substantially filling said bore, the free end of the film being adapted to pass through the slit in said pin when the slit is in alignment with said slot, whereby when the pin is rotated, said slit will be brought out of alignment with the slot between the jaws and a portion of the film will be clamped between the pin and said jaws.

4. In a film clip, the combination of a metal bar having jaws forming an internal bore, said bar being of substantially cylindrical shape and having a flat longitudinal extension, and a split pin rotatably mounted within and substantially filling said bore, the free end of the film being adapted to pass through the slit in said pin, whereby when the pin is rotated, a portion of the film will be wound about said pin and clamped between the latter and said jaws.

5. In a film clip, the combination of a metal bar of oblong cross section and having two jaw members each forming an internal bore in said bar, and a split pin rotatably mounted within and substantially filling each bore, the free end of the film being adapted to pass through the slit in one or the other of said pins, whereby when the pin is rotated, a portion of the film will be wound about said pin and clamped between the latter and said jaws.

6. In a film clip, the combination of a substantially cylindrical metal bar having jaws forming an internal bore, the outer ends of said jaws being spaced apart to provide a slot therebetween, said slot being offset relatively to the axis of said bore, and a split pin rotatably mounted within and substantially filling said bore, the free end of the film being adapted to pass through the slit in said pin, whereby when the pin is rotated, a portion of the film will be clamped between said pin and said jaws.

7. In a film clip, the combination of a metal clasping member having jaws forming an internal bore, the free ends of said jaws being spaced apart to form a slot therebetween, and a pin rotatably mounted within and substantially filling said bore, said pin being slitted to provide a pair of longitudinally extending branches, the free end of the film being adapted to pass through the slit in said pin, whereby when the pin is rotated, a portion of said film will be pressed against one of the jaws by one of said branches while the other branch is bearing on the other jaw.

8. In a film clip, the combination of a clasping member having jaws forming an internal bore, the free ends of said jaws being spaced apart to form a slot therebetween, and a pin adapted to be inserted within said bore, said pin being slitted to provide a pair of longitudinally extending branches, the free end of the film being adapted to pass through the slot between said jaws and into said bore, whereby when the pin is inserted within said bore, a portion of said film will be pressed against one of the jaws by one of said branches while the other branch is bearing on the other jaw.

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