

[54] **CINEMATOGRAPHIC BROAD SCREEN
RECORDING AND PROJECTION
METHOD AND A FILM CARTRIDGE
FOR CARRYING OUT THE METHOD**

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[51] Int. Cl.G03b 23/02

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352/38, 44, 69

[56]

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[57]

ABSTRACT

A cartridge for unsplit double track film has the supply core and take-up core arranged to slide in guides automatically without a positive drive. A roller is journaled at the corner of the housing adjacent the take-up core to support the film coil on the winding core irrespective of the coil diameter. The wound film lifts itself over the roller in the guide and presses the core of the supply coil back automatically.

2 Claims, 9 Drawing Figures

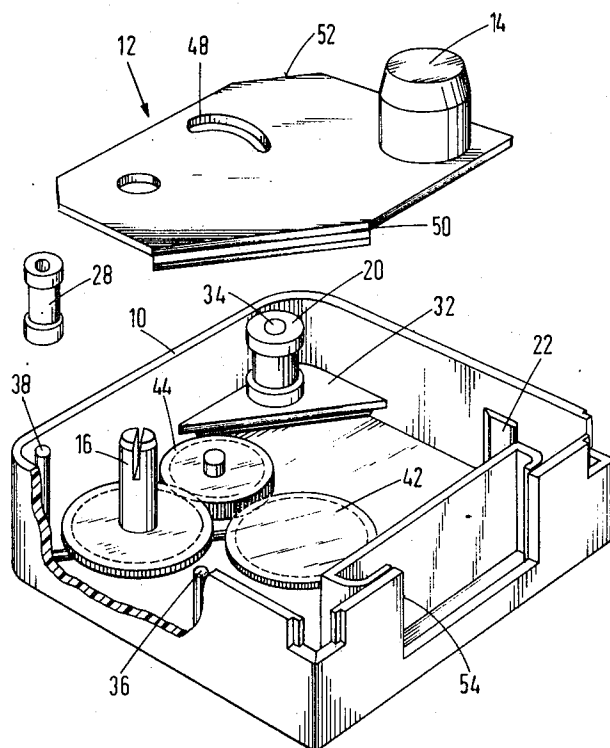
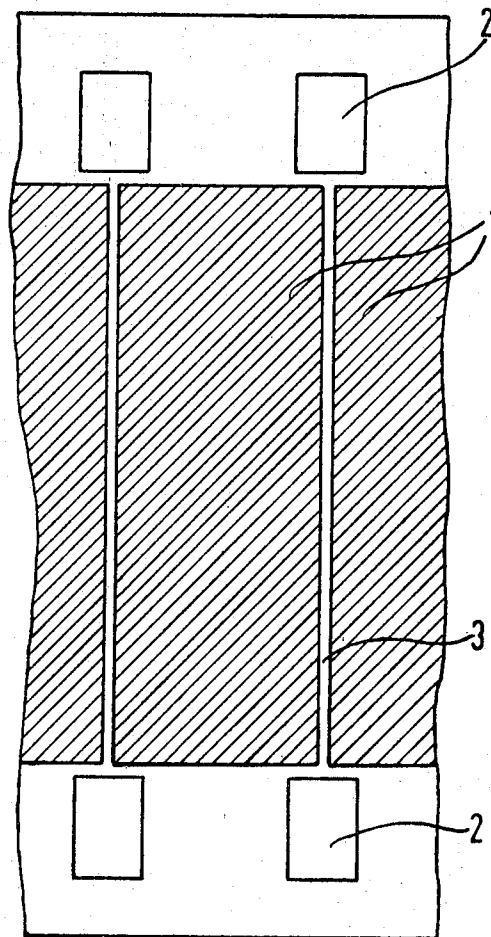


Fig. 1



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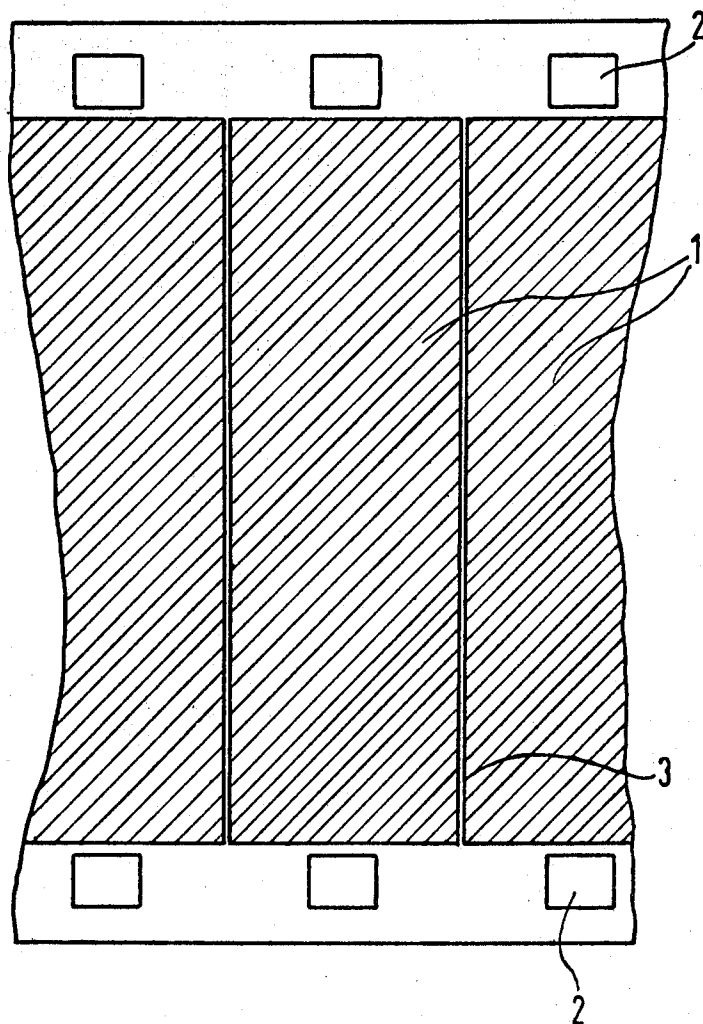
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Fig. 2



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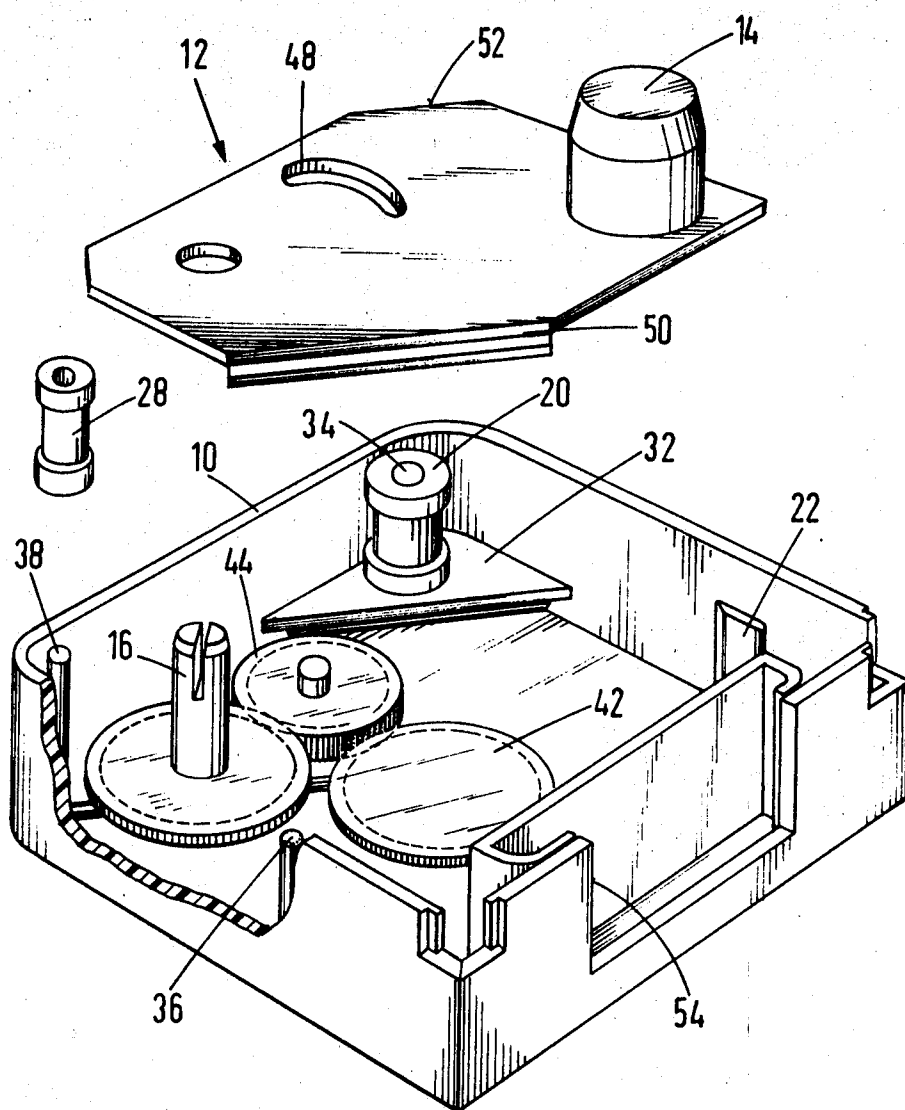
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Fig. 3



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Fig. 4

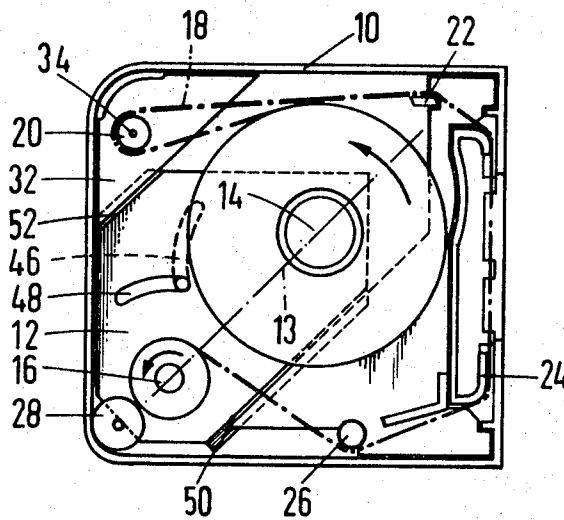
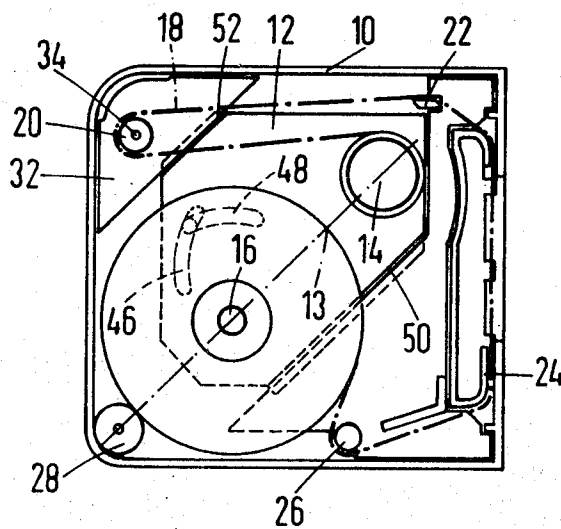


Fig. 5



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Fig. 6

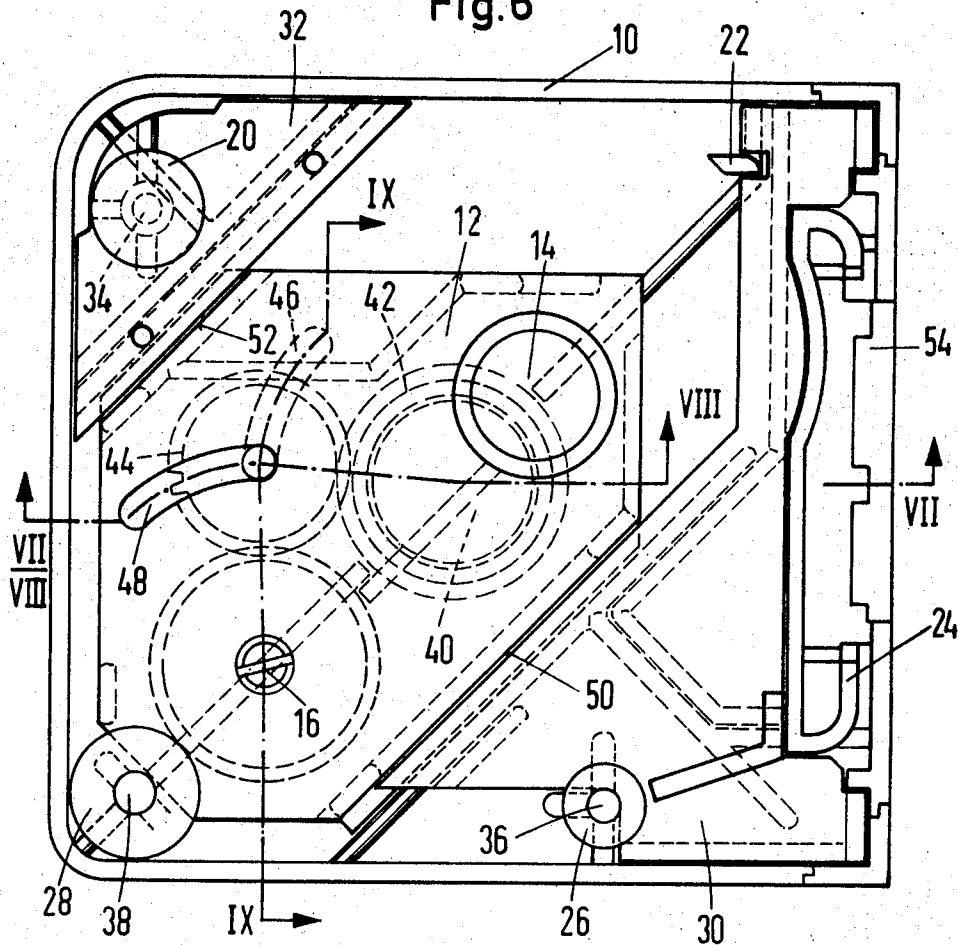
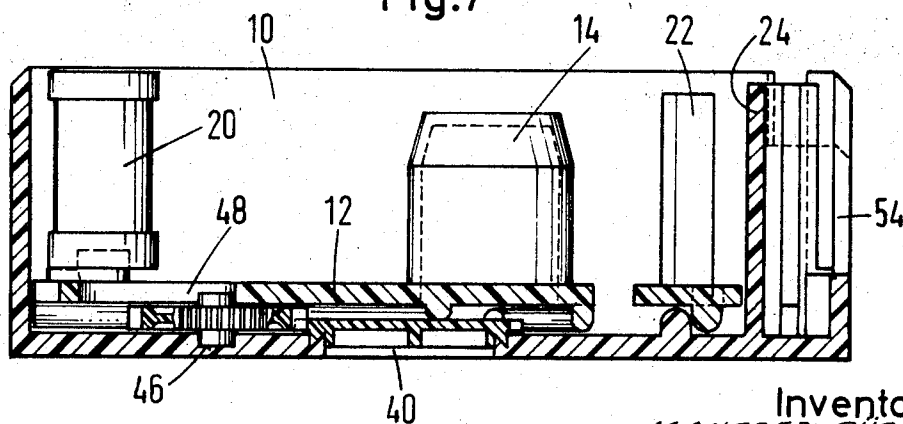


Fig. 7



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Fig. 8

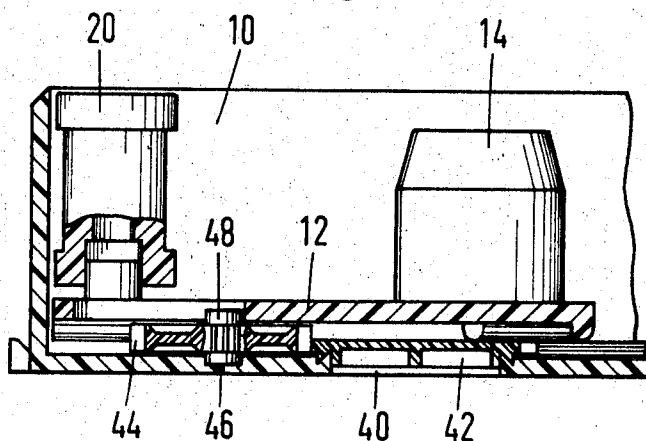
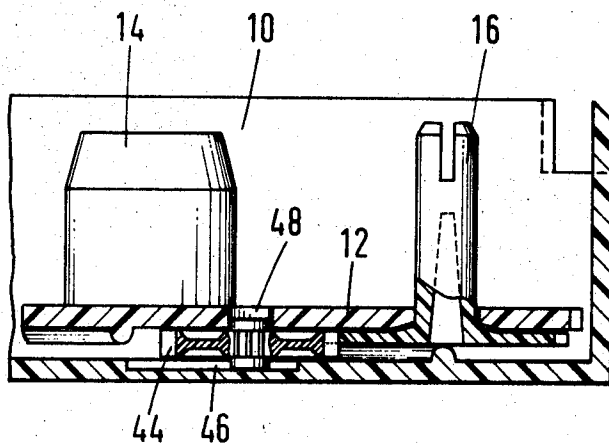


Fig. 9



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CINEMATOGRAPHIC BROAD SCREEN RECORDING AND PROJECTION METHOD AND A FILM CARTRIDGE FOR CARRYING OUT THE METHOD

BACKGROUND OF INVENTION

1. Field to Which Invention Relates

The invention relates to cinematographic broad screen recording and projecting methods, more particularly but not exclusively for ciné films as used by amateurs.

2. The Prior Art

While formerly the "normal" height-side ratio of 1:2 was exclusively used for the picture format of cinematographic series of pictures, there has been recently a trend, more particularly for the purpose of improving the visual stereoscopic effect, to project broad screen pictures whose breadth dimensions are substantially increased with respect to the "normal" format. Thus for example in the case of a 35 mm standard film a picture size of 12.6 20.9 mm is conventional so that there is a ratio of 1:1.66. In the case of this broad screen method and in the case of all other known projection methods, in which with a normal film transport step the corresponding height and breadth ratio is simply obtained by using a suitable dimensioned picture opening, there is necessarily a poor use of the film which is available. In order to make better use of the normal film format available for broad screen projection there has been a proposal to compress and expand the image respectively on recording and projection using anamorphic systems. This, however, requires the use of expensive optical systems for filming and reproduction. For the ciné film sector this method, known as the "cinemascope" method could not be of any practical application because the grain structure of the film in the case of the small film surfaces available no compressing is possible without an elliptical distortion in one dimension on projection. In the case of amateur ciné films, which are practically all of 8mm breadth at the present time, however, a reduction of the picture height (in extreme cases for as much as 50 percent) cannot be considered on the one hand because of wastage of film and on the other hand owing to the relatively small projection format which can be achieved. Furthermore neither in the case of normal standard film nor in the case of ciné film has it been possible to introduce systems in which for a better exploitation of the film format in the breadth direction the picture surface is broadened out as far as the perforated edge, in which case the perforations would either come in the middle or laterally between two picture areas. Apart from the picture spacing necessary owing to the perforations and the wastage of film due to this, the methods required projection and recording apparatus and method steps which were not compatible with conventional methods so that they found no acceptance in practice.

In accordance with a further prior proposal broad screen pictures or panorama images were to be produced in such a manner that each individual image of a recorded scene had a format on the film which was twice the size of a standard image. In this case two succeeding picture areas were combined to form a single broad screen image or picture whose height corresponds to the breadth of a normal picture and whose breadth corresponds to twice the height (with the addi-

tion of intermediate space). Both in the case of recording and also in the case of projecting it is necessary, in the case of this known method, to turn the image through 90°, something that makes necessary either the use of a suitable set of prisms or the arrangement of the film to travel in a horizontal direction.

Both in the case of film exposure and also in the case of projection a double film transport step is necessary. This method also requires such a substantial modification of conventional filming and projecting apparatus that it has not been able to find any acceptance in practice.

SUMMARY OF INVENTION

The invention is based on such a cinematographic broad screen recording or filming and projecting method in which two adjacent picture areas of the film are simultaneously exposed and projected respectively.

One aim of the invention is to modify a cinematographic method of the last mentioned type, in which two adjacent image areas of the film are simultaneously exposed and projected, in such a manner that without changing from the normal transport step and without turning of the image a broad screen image or picture can be produced and projected.

In accordance with the invention this aim is attained in the case of a cinematographic broad screen method of the above-mentioned type in that a double track film is used on which laterally adjacent picture areas are disposed transversely to in the direction of travel of the film are exposed simultaneously during a normal film transport step and in that during the reproduction of the unsplit double track film broad screen images are projected using the aforementioned adjacent areas during a single film transport step.

The term "double track film" is to be taken to mean such a film which in accordance with its purpose is provided during filming with two adjacent rows of images and is split in the middle so that during projection only the perforation row of one edge is available for transport. The best-known example of such a "double track film" is the "double 8 film" 16 mm film with two sets of perforations) as has been used exclusively for some time for amateur purposes. The "super 8" films are also capable of being used in the method in accordance with the invention, if the films are obtained, instead of using the normal manner, by splitting a "double track film". Finally the invention is also capable of being used for example for 35 mm "double track film" which when split yields two 17.5 super films.

The use in accordance with the invention of such "double track films" makes it possible, while only making a relatively slight alteration in the filming and projecting apparatus available, to obtain the desired broad screen projection, by exposing two series of pictures in a double track width in the film camera, these series of pictures being conventionally arranged so as to run in opposite directions, the projecting apparatus again making a projection of the double track width.

As compared with the above-mentioned method, in which two film areas adjacent to each other in the film travel direction are combined to form a single image, the invention furthermore has the advantage of a broader format, because in accordance with the invention two adjacent images of standard format are com-

bined to form a broad screen format, that is to say the breadth of the image is double that of the normal breadth, while the height is equal to the height of a normal image.

Since the modifications of the filming and projecting apparatus necessary for carrying out the method are relatively simple, the well-established normal-double-8-method and the double-super-8-method -metho come into consideration for the method in accordance with the invention, more especially, because most forms of apparatus function in accordance with these methods.

In manufacture the design of the apparatus need only be changed slightly. In the case of the camera the film mask and objective, and possibly also the sector shutter only need to be changed, while in the case of the projector the film guiding arrangement must additionally be made broader. In this case the construction can at the outset be made in such a manner that it is possible to work selectively with a broad screen format or with a normal format.

Since in accordance with the method in accordance with the invention the series of images are joined together directly while leaving an intermediate space necessary for overlap, the surface of the film which is available is completely used. Neither in the case of the film camera nor in the case of the projector do changes have to be made as regards the transport step.

Furthermore the invention has the aim of making the cinematographic recording method also applicable for film cameras which are made for the super-8-method, that is to say are designed for use with cartridges which have a square shape and in which the supply core and the take-up core lie on a single axis in two planes and the film runs from one plane to the other and passes the picture opening.

In accordance with the invention this aim is achieved in that the cartridge in its external dimensions and in the functional elements co-operating with the cinematographic apparatus corresponds to standard cartridges (more particularly super-8cartridges), which have a film perforated on one side which is taken up on two coaxial winding cores which are arranged inside the cartridge in a plane laterally adjacent and carry a double track film, the film image opening and film gate extending over the whole breadth of the double track film between these perforated edges.

Accordingly the invention is based on the realization that the functional elements of cinematographic camera, which in accordance with the purpose in view, bring about the transport of a film with perforations on one side, can be used also for the transport of unsplit double track film without any modification if the cassette has a suitable construction. Super-8-cartridges are suitable because owing to the normally coaxial arrangement of the winding cores within the housing the space is left for a film which is twice as broad. However, the invention is primarily directed to the "super-8-method," although the use of the invention for other formats or cartridges can be considered in which conditions are similar.

The invention is also not only suitable for cartridges in cameras, but also for cartridges for projectors.

In the application of the invention for conventional super-8-cartridges, and also in the case of the other for-

mats, difficulties may occur in the case of the accommodation of a certain length of film. Both the take-up core and also the supply core must be arranged at a certain distance from the maximum winding radius of the cartridge housing. In order now in the case of the given housing dimensions of the cartridge to accommodate a double track film length in the cassette, which corresponds to the film length of a film perforated on one side as otherwise used in such a cartridge, there is the arrangement in accordance with the invention such that the winding cores are arranged so as to slide in guides and that the winding cores are connected via a drive with a drive hub mounted in the cartridge. This mounting in the cartridge of the drive hub corresponds in size, shape and arrangement to the hub of the take-up -core used as above indicated in conventional super-8-cartridges. Owing to the construction of the winding cores so as to slide in the guide an excellent use of the space is made possible because with this feature the mutual spacing of the winding cores and the spacing from the housing is achieved in accordance with the winding diameter.

This type of coil or bobbin guidance is not limited to application in the case of super-8-cassettes, but may also be used in accordance with the invention with moving spool cores, including those for film perforated on one side.

A particularly suitable arrangement is achieved in the case of a diagonal guidance of the winding cores within the substantially square housing of a super-8-cartridge or cassette. It is then possible also to accommodate a double track film of approximately 15 meters in length in such a cartridge and this corresponds to the length of a super-8-film arranged for the purpose in view in such a cartridge.

The shifting of the winding cores in their guide means occurs conveniently automatically without a positive drive. In accordance with a preferred embodiment of the invention a roller is journaled at the corner of the housing associated with the take-up core in such a manner that the roller supports the film coil on the winding core irrespective of the coil diameter so that the film does not come into contact with the walls of the housing. In this manner the wound film lifts itself over the roller automatically in the guide means and presses the core of the supply coil back automatically so that the contact of the film strip on the coils is barred, because the winding cores are arranged at a fixed distance on a slide. As a drive between the drive hub and the take-up core it is possible to make use of a simple wheel drive with a wheel or gear wheel journaled so that its axis can move, the axis of the last mentioned wheel running in a positive guiding means.

LIST OF SEVERAL VIEWS OF DRAWINGS

In what follows the invention will be explained with reference to embodiments of it shown in the drawing.

FIG. 1 is a film section of an exposed double-8-film.

FIG. 2 is a film segment of an exposed super-8-film.

FIG. 3 is a perspective exploded representation of the cartridge with the lid removed.

FIGS. 4 and 5 are diagrammatic inner views of the cartridge or cassette in accordance with the invention with the film coil arrangement before exposure and after exposure respectively.

FIG. 6 is an inner view of the housing.

FIGS. 7, 8 and 9 are sections on the lines VII—VII, VIII—VIII and IX—IX in FIG. 6.

DESCRIPTION OF PREFERRED EMBODIMENTS

FIGS. 1 and 2 indicate that the individual images 1 extend over the whole breadth of the film so as to come close to the lateral perforations 2. In the vertical direction the images 1 run through one transport step and leave between them unexposed gaps 3 which correspond in breadth to the breadth of the usual intermediate space or gap.

In the case of double-standard-8-films the image breadth available is about 10 mm and the height about 3.7 mm so that there is a height-breadth ratio of approximately 1:2.8.

In the case of double-super-films the corresponding data are approximately as follows:

Image breadth 12.5

Image height 4.1

Height-breadth ratio 1:3.1.

FIGS. 3 to 9 show a film cartridge or cassette suitable for carrying out the exposing method.

As can be seen more particularly from FIGS. 3 to 6, a slide 12 is arranged within the cassette or cartridge housing 10 so that it can be moved or shifted along the diagonal 13. The slide 12 carries the core 14 of the film supply and the core 16, on which the film is taken up. The film 18 running from the supply coil firstly passes over a guide roller 20, then over a connecting part 22 ahead of the picture gate 24 and from thence runs over a guide roll 26 towards the take-up core 16.

In the left-hand lower housing corner shown in FIG. 6 a roller 28 is journaled which bears against the film coil as it increases in diameter. This causes the slide 12 to be displaced upwards along the diagonal 13 against the force which the film guided by the roller 20 exerts on the slide. FIG. 4 shows diagrammatically winding of the film for exposure and FIG. 5 shows the arrangement after completion of exposure.

In the right-hand lower corner shown in FIG. 6 the slide guiding means 30 can be fixed positively in position. The upper corner on the left-hand side shown in FIG. 6 is included in the slide guiding means 32. The latter carries the bearing pin 34 for the guide roller 20. The guide roller 26 is placed on a pin 36 fixed in the housing 10. The pressing roller 28 is mounted on a pin 38. The bottom of the housing has in a conventional manner a hole 40 through which the bobbin drive extends and has a flat disc whose part of greater diameter lying within the housing has teeth. The teeth of the disc 42 mesh with a gear wheel 44 whose carrying pin is supported by a curved slot 46 in the housing bottom on the one hand and a curved slot 48, approximately perpendicular to it, in the carriage of the slide 12 on the other hand. This gear wheel 44 is constantly in mesh with a gear ring on the take-up core 16, which is mounted in a

fixed manner in the slide 12. The core 14 of the supply coil is mounted on the slide 12 with a fixed distance from the core 16 of the coil to be wound up. The slide has parallel sliding faces 50 and 52 which can slide between the slide guiding means 30 and 32 in the housing.

As can be seen from FIG. 3, the front wall has an opening 54 extending over the whole film breadth, behind which the film gate 24 lies, and through which the claw system of the film camera extends. These film transport parts draw off the film from the supply coil and move it past the film gate. The despooling mechanism of the camera engages the disc 42 arranged in the opening 40 and the disc 42 turns the take-up core 16 via the gear wheel 44. Owing to the increasing coil diameter the slide 12 is moved upwards by the roller 28 in the slide guide means 32, 30 along the diagonal 13, the slot guide means 46, 48 guiding the pin on which the gear wheel 44 is journaled in such a manner that it always remains in connection with the wheels 42 and 16.

I claim:

1. A cartridge for carrying and transporting elongated cinematographic film, or the like, comprising:

a housing with enclosing side walls;

a slide guide means in said housing for guiding shifting of a slide;

a slide, supporting a supply core for supplying film and supporting a take-up core, spaced away from the supply core, for taking up the supplied film;

said slide being movable through said housing along said slide guide means between a first position where said take-up core is nearer to one said housing enclosing side wall and said supply core is further from another said housing enclosing side wall and a second position where said take-up core is further from said one said housing enclosing side wall and said supply core is nearer to said another said housing enclosing side wall;

said housing fixedly supporting a bearing element which is positioned near the one said housing side wall to bear against the film on said take-up core as the film reeling on said take-up core increases in diameter, thereby to cause said slide to move from said first toward said second position.

2. The cartridge of claim 1, further comprising:

a drive means connected with said take-up core to drive said take-up core; said drive means including a drive gear;

said take-up core including a hub which meshes with said drive gear; said drive gear being supported by a pin extending through a slot in said housing and through a separate slot in said slide; said slots each being curved and intersecting substantially perpendicularly to each other to guide shifting of said drive gear pin as said slide moves.

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