May 11, 1926. 1,584,296

W. HOHMANN

METHOD OF AND APPARATUS FOR PRINTING INDEXING SYMBOLS ON FILMS

Filed August 2, 1924 2 Sheets-Sheet 1

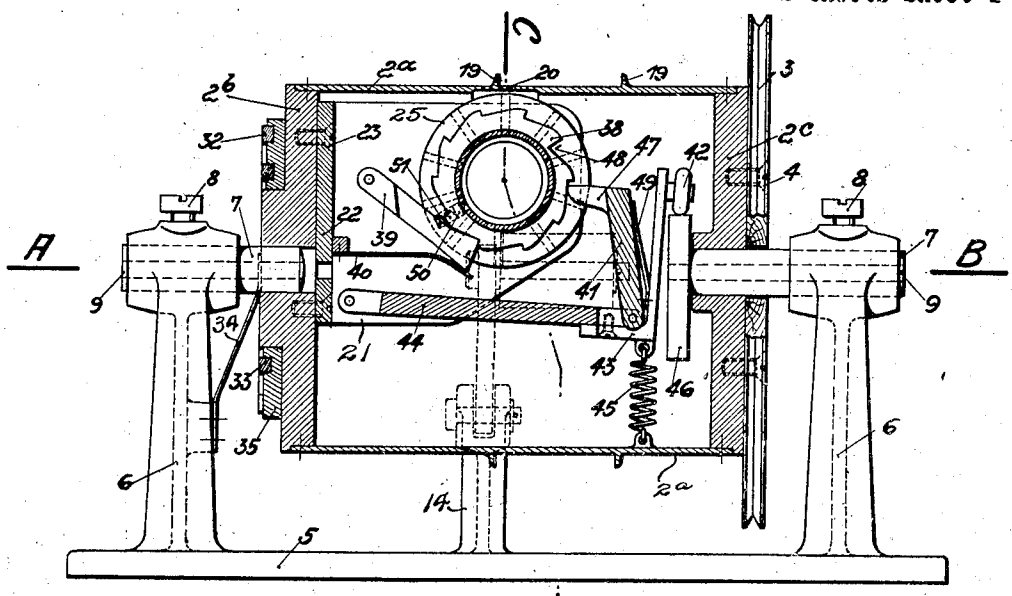



Fig. 1

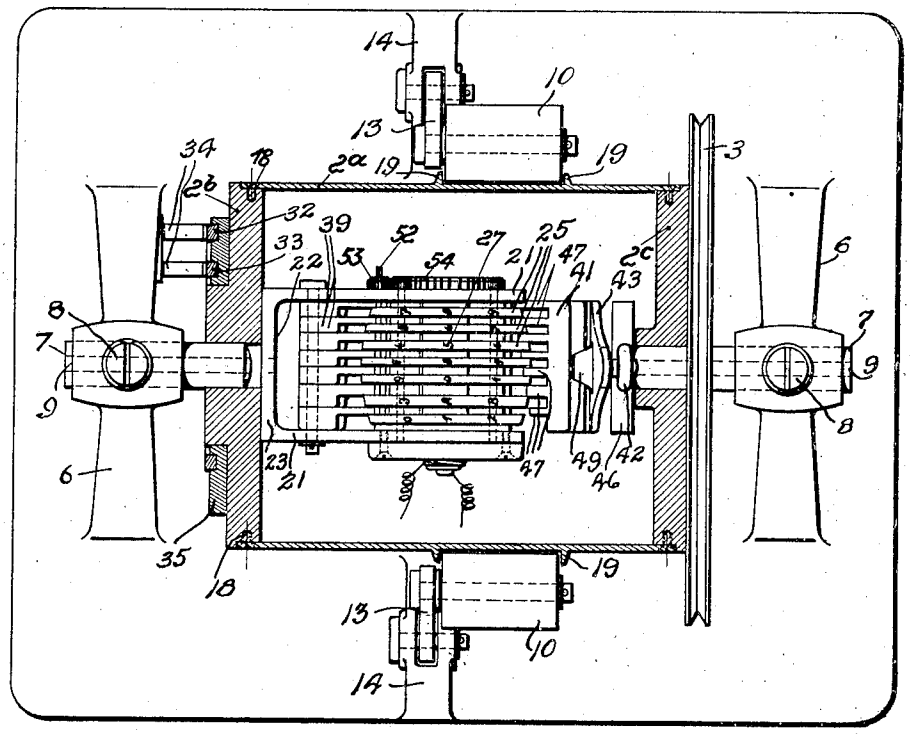



Fig. 2

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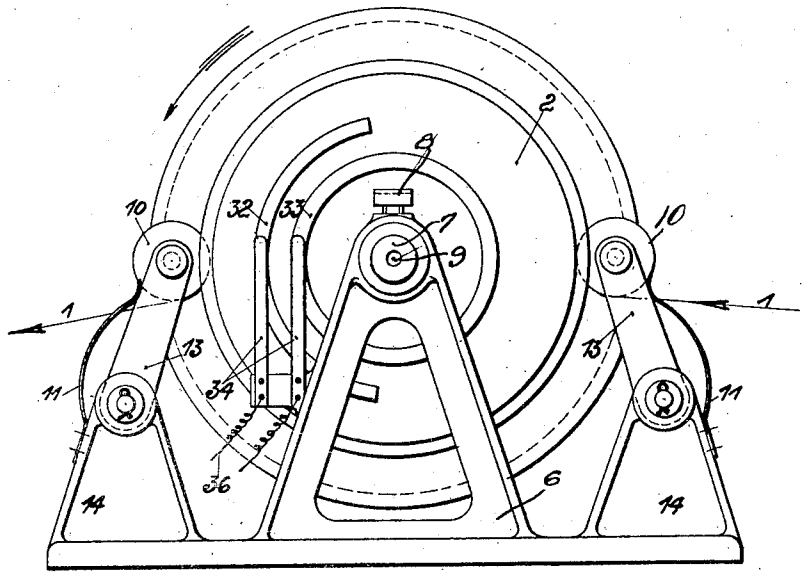



Fig. 3

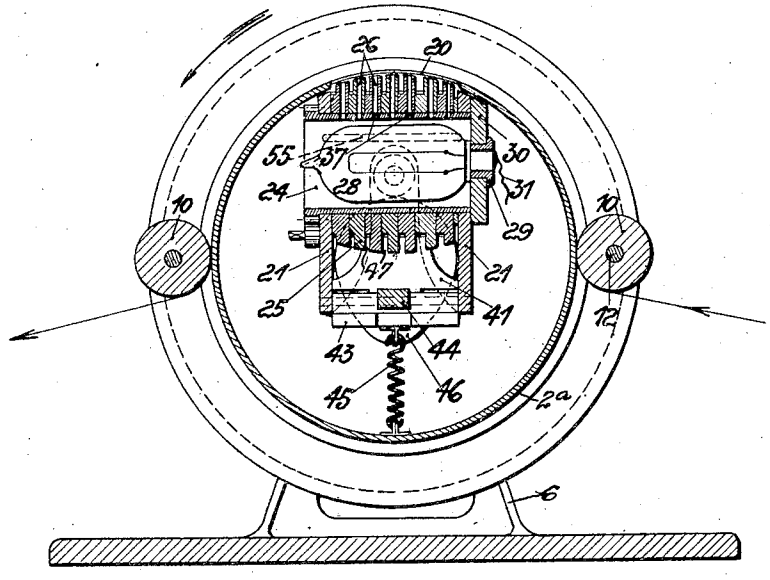



Fig. 4

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# UNITED STATES PATENT OFFICE.

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## METHOD OF AND APPARATUS FOR PRINTING INDEXING SYMBOLS ON FILMS.

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The present invention relates to an improvement upon devices for photographing indexing symbols on films.

Devices of this character, as is well known, operate upon the principle of printing symbols upon the marginal portion of film sections during the periods of rest. However, due to the very short duration of these periods is it difficult to effectively print without the use of strong light which, in turn, entails practical disadvantages.

It is the object of this invention to provide a method of and apparatus for expeditiously printing symbols on films.

For a full understanding of the invention, the principle of operation upon which it is based and its practical significance, reference is made to the accompanying drawings in which

Fig. 1 is a longitudinal section through a device embodying the invention;

Fig. 2 is a section on line A—B, Fig. 1, the enclosed mechanism being shown in plan view;

Fig. 3 is an end view; and

Fig. 4 is a transverse section on line C—D, Fig. 1.

The film 1, a marginal portion of which is to be printed, is passed over a drum 2 and is pressed into frictional contact with a considerable portion thereof by means of rollers 10 pivotally supported upon pedestals 14 through links 13 acted upon by springs 11.

The drum is revolubly mounted upon journals 7 supported in standards 6 and secured in position by means of set screws 8. The drum may be revolved by any suitable means, as for instance by means of a belt drive including a pulley 3 secured to an end face of the drum by means of screws 4.

The drum has peripheral ribs 19 between which the film is received and guided. As indicated in Figs. 1 and 4, the drum has a narrow peripheral slit 20 close to one of the ribs 19 through which the printing takes place.

The mechanism for carrying out the printing operation is contained within the drum and revolves with it. To one of the end walls of the drum is secured, as by screws 23, a frame including a base plate 22 and side walls 21, the latter being formed as bearings for the tubular element 24. This element has a plurality of spaced apertures 37 in axial alignment with each other and in vertical alignment with the slit 20 in the drum 2. On the tubular element 24 are mounted a plurality of disks 25 having ten equidistant radial bores 26, the bores of all the disks being in axial alignment. The apertures 37 are so spaced as to simultaneously register with a set of axially aligned bores 26 in the different disks 25. Across the outer end of each bore 26 is placed an element defining a light modifying element for producing different indicia or symbols upon the film. In the tubular element 24 is disposed a light bulb 28 from which light will pass through the apertures 37 and a set of axially aligned bores 26 and as modified by the corresponding means through the slit 20 upon the film.

Each disk has a ratchet 38 containing ten teeth to be engaged by pawl mechanism operative in such a way that the symbols are printed in any predetermined orderly series. For the sake of example, I have provided five disks carrying each numerals 0–9, a separate disk carrying the letters A, B, C, etc., and an additional disk carrying the numerals 0–9. Thus may be printed reference characters containing 0–99999, qualified by any of the letters A, B, C, etc., and further qualified by a preceding numeral, as for instance 6 H 56983. So far as the scope of the invention is concerned, it is immaterial what form of indexing system is chosen.

In the form represented, I use a stepped pawl system by means of which one disk is caused to make a complete revolution before the next disk can be moved. As indicated in Fig. 1, each ratchet has one notch 48 cut deeper than the other notches defining the teeth and, as indicated in Fig. 2, the pawl elements 47 for the different ratchets are successively receding. By thus differently notching the different ratchets and cutting one of the notches in each ratchet deeper than the others, the different disks may be moved to print the characters in consecutive series, in analogy to counter mechanisms. The pawl elements 47 form integral parts of a pawl 41.

The pawl 41 is pivotally mounted near one end of a lever 44 which is pivotally supported at its other end between the side walls 21. To the free end of lever 44 is attached an angular extension 43 carrying

at its upper end a roller 42 bearing upon an eccentric 46 on one of the journals 7. A spring 45 attached to the drum 2 and the angular piece 43 keeps the roller 42 in contact with the eccentric 46. A spring 49 secured to the angular extension 43 tends to move the pawl 41 toward and into engagement with the ratchets 38. Each of the ratchets is also engaged by a pawl 39, preventing motion in one direction, the pawl 39 being pivoted between the side walls 21, and acted upon by separate springs 40 secured to the base plate 22.

The light bulb 28 may be mounted in a screw socket 29 in a board 30 of insulating material and the current connection is made by means of two leads 31 which may be connected through one of the end walls of the drum to segmental slide pieces 32 and 33 which are mounted upon a disk 35 of insulating material on the outer surface of the end wall. From the segmental slide pieces 32 and 33 the connection may be made to a source of electric current by means of spring blades 34, as indicated.

The cylindrical part $2^a$ of the drum may be detachably secured to the end pieces $2^b$ and $2^c$ by screws 18.

Whenever it is desired to reset the disks 25 to zero position, the resetting operation may be quickly carried out. In each of the disks is a bore containing a pawl 50 pressed inwardly by a spring 51. In the outer surface of the tubular element 24 is a longitudinal groove 55, as shown in Fig. 4. When the element 24 is revolved, as for instance by means of a knob 52, pinion 53 and gear 54, the pawls will snap into position permitting a quick alignment in the proper order.

The operation of the device is as follows: The light of the bulb 28 passes outwardly through the apertures 37, bores 26 and the slit 20 upon the film thereby printing the symbols across the ends of the bores 26. The mechanism within the drum revolves with the latter so that in the arrangement illustrated the printing operation continues for half a revolution of the drum, i. e. from the time the slit 20 comes opposite the film until it passes away from it.

The change in the printing mechanism is effected while the slit is below the plane of the rollers 10. The cam 46 is so constructed that the pawl 41 is moved during that period. Thus during that part of each revolution that the slit 20 is turned away from the film, the printing mechanism is changed to print another symbol.

The disposition of the slide segments is such that the light is cut off during the interval when the slit 20 is not directly under the film. It is of course not necessary to interrupt the current through the bulb, if provisions are made to otherwise protect the film as for instance by suitably screening it.

The journals 7 are preferably provided with bores 9 through which the hot air in the drum may be expelled and cool air introduced, respectively.

While I have shown only one specific embodiment of the invention, there is of course considerable latitude of construction in different directions. Thus, in particular, while I consider rotary movement best adapted for the purpose of the invention, as indicated, other movement by which sustained light effects may be produced, may be resorted to.

I claim:

1. Apparatus for photographically printing symbols upon a film, comprising a drum having an exposure opening in its cylindrical wall, means for maintaining a film in frictional contact with a portion of the drum surface, a source of light in the drum, means defining symbols and means within the drum for selectively positioning the symbols between the light and the exposure opening.

2. Apparatus according to claim 1, where in the means for varying the light effects comprise a plurality of printing characters and means for bringing any one of said printing characters into printing position.

3. Apparatus according to claim 1, wherein the means for varying the light effects comprise a plurality of printing characters mounted for rotation about the source of light past the exposure opening.

4. Apparatus for photographically printing symbols upon a film, comprising a drum having in its cylindrical wall a peripherally extending slit defining an exposure opening, a source of light in the drum, means within the drum for varying the light effects through the exposure opening, including means for simultaneously presenting a plurality of printing characters in alignment with the exposure slit and means for severally changing said characters, and means for maintaining a film in frictional contact with a portion of the drum surface.

5. Apparatus according to claim 4, wherein the means for changing the characters include a plurality of wheels each carrying a plurality of printing characters and means for moving the wheels relatively to each other.

6. Apparatus according to claim 4, including means for automatically changing the characters in orderly sequence.

7. Apparatus for printing symbols upon films, comprising a revolubly mounted drum having an exposure opening in its cylindrical wall, means for maintaining a film in frictional contact with a considerable portion of the drum surface, photographic printing mechanism mounted within the drum and revoluble therewith and disposed to print upon the film through the exposure opening and means for changing the character of the printing effect during each rev-

olution of the drum while the exposure opening is out of printing relation with the film.

8. Apparatus for printing symbols upon films, comprising a revolubly mounted drum having an exposure opening in its cylindrical wall, means for maintaining a film in frictional contact with a considerable portion of the drum surface, photographic printing mechanism including a source of light and means automatically operative during each revolution of the drum to vary the character of the printing effect while the exposure opening is out of printing relation with the film and means for preventing light effects upon the film while the latter is out of printing relation with the printing mechanism.

9. Apparatus according to claim 8 in which the means for preventing light effects upon the film consists of means for preventing emission of light through the exposure opening.

10. Apparatus according to claim 8, wherein the means for preventing light effects upon the film consists of means for making the source of light ineffective.

11. Apparatus of the class described, comprising a movably supported hollow body having an exposure opening, a source of light within the body, a plurality of light-modifying means, a carrier therefor movable relatively to the source of light for successively interposing different light-modifying means between the source of light and the exposure opening and means responsive to cyclic motion of the hollow body for automatically moving the carrier.

12. Apparatus according to claim 11 including a tubular member having a lateral opening, a disk having a plurality of radial bores, said disk being revolubly mounted upon the tubular member so that during its rotation the radial bores come successively into alignment with the said lateral opening and the exposure opening and means at the outer ends of the bores representing different light modifying characters, the source of light being contained within the tubular member.

13. Apparatus of the class described, comprising a revolubly supported drum having an elongated exposure opening in its cylindrical wall, a tubular member within the drum disposed at right angle to the axis thereof, the drum having a plurality of axially aligned lateral openings, a plurality of disks having each a plurality of uniformly spaced radial bores, said disks being revolubly mounted upon the tubular member so that the radial bores of each disk come successively into register with one of said lateral openings and the exposure opening, means at the outer ends of the bores constituting different light modifying means, and means operative during a part of each revolution to effect an orderly change in the position of the disks relatively to each other.

14. Apparatus of the class described, comprising a drum having an elongated exposure opening in its cylindrical wall, a tubular member in the drum mounted at right angle to the axis thereof and having a plurality of axially aligned lateral openings, a plurality of disks having each a plurality of radial bores and a ratchet, the disks being revolubly mounted on the tubular member so that the bores of each disk come successively into register with one of the lateral openings and the exposure opening, means at the outer ends of the bores constituting different light-modifying means, pawl mechanism for engaging the ratchets of the different disks and means automatically operative to actuate the pawl during a part of each revolution of the drum, the ratchet and the pawl being so constructed and correlated as to effect an orderly change in the disks relatively to each other.

15. Apparatus according to claim 14 in which the pawl actuating means includes a stationary cam disposed within the drum, a roller cooperating with the cam and spring means for holding the roller in contact with the cam.

16. Apparatus of the character described, comprising a drum having an exposure opening an electric light mounted in the drum and revoluble therewith, segmental sliding contacts mounted on the outer surface of one of the end walls of the drum and connections between the said contacts and the source of light.

17. Apparatus of the class described, comprising a drum having an exposure opening, a light in the drum, means within the drum for varying the character of the light effects through the exposure opening, and means for rotating the drum including hollow journals, one of the journals carrying a cam forming part of the means for varying the character of the light effects.

In testimony whereof, I affix my signature.

WILHELM HOHMANN.