

May 25, 1937.

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2,081,187

PHOTOADDRESSING SYSTEM

Filed Oct. 28, 1935

2 Sheets-Sheet 1

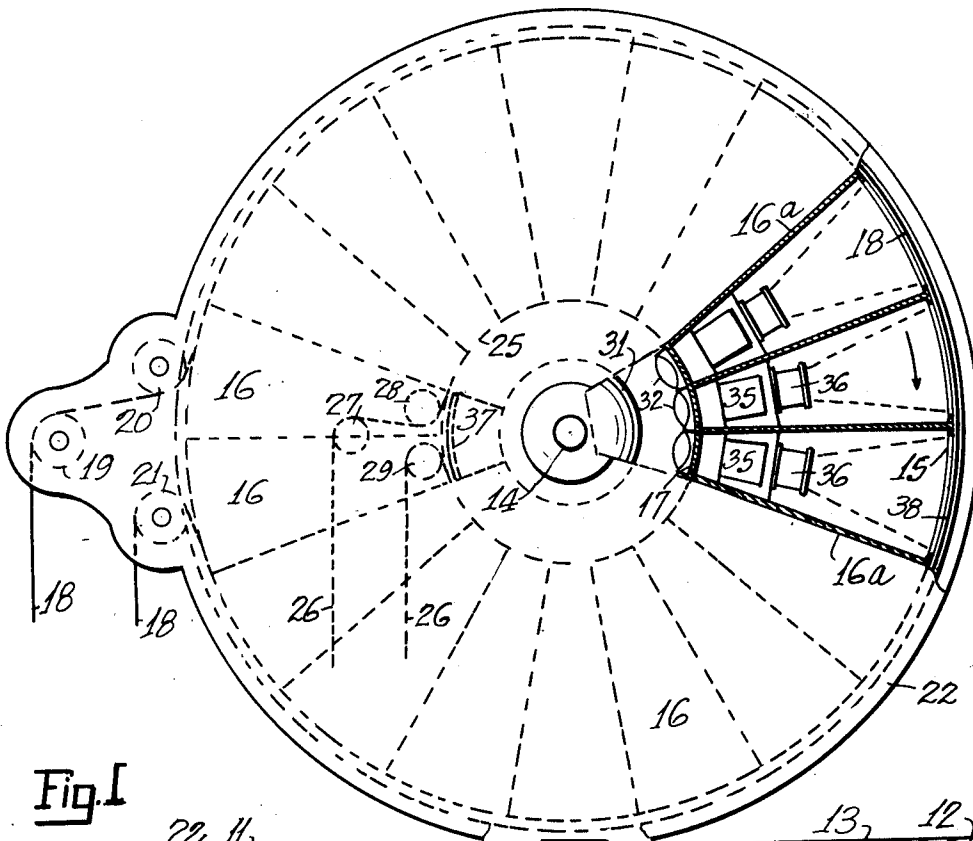


Fig. 1

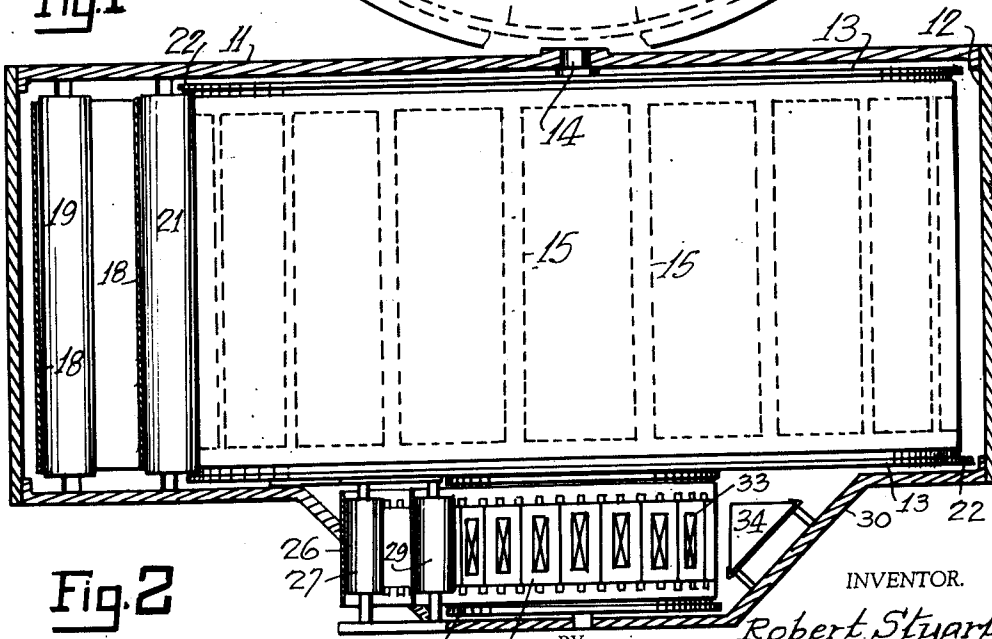


Fig. 2

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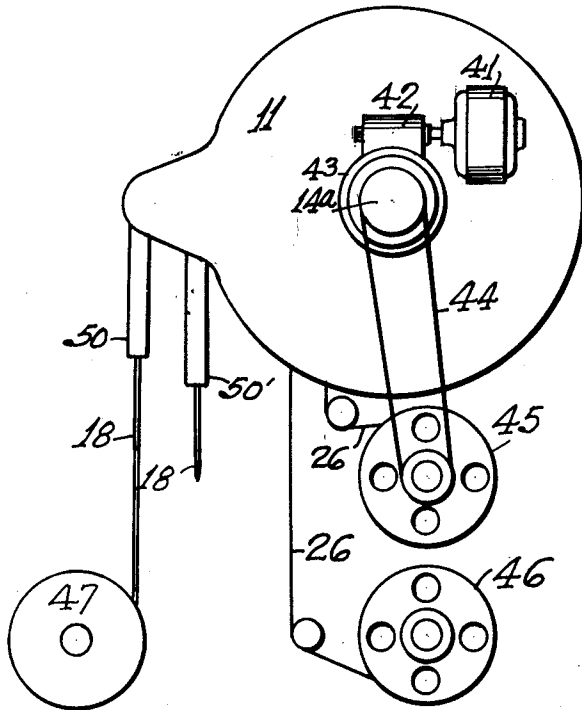


Fig. 4

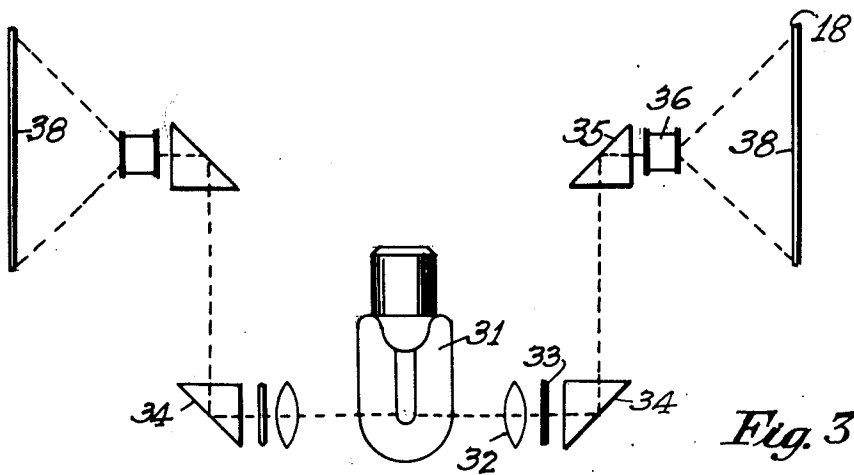


Fig. 3

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PHOTOADDRESSING SYSTEM

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Application October 28, 1935, Serial No. 47,040

6 Claims. (Cl. 88—24)

This invention relates to a system for enlarging and printing the pictures of a motion picture film by a continuous process, and to certain applications of this system. An object of the invention is to enlarge and print upon a paper band picture subjects corresponding to the frames of a motion picture film. Another object of the invention is to print a plurality of enlargements at the same time. Another object of the invention is to provide a printing wheel having a drum for receiving the motion picture film and a larger drum for receiving the paper band, which are held in fixed relation as the wheel rotates, and the printing is carried out during the rotation. A further object of the invention is to enlarge and print the pictures on a motion picture film upon a paper tape or band by a continuous motion.

The picture subjects are enlarged and printed from a motion picture film by projection on a band of paper. The printing on the paper is comparatively slow due to the enlargement of the picture, and also because a less expensive emulsion may be used on the paper than is required for rapid exposures. The drum is divided radially having a compartment for each picture frame and is provided with a stationary light in the center. Each picture is printed by itself for almost a complete revolution of the drum.

Other objects of the invention will be more fully understood from the following specification and the accompanying drawings, in which:

Fig. 1 is a plan view of the printing wheel, with a portion of the cover removed and the separating walls of the light compartments shown in section;

Fig. 2 is an elevation of the printing wheel with the outside cover sectioned;

Fig. 3, is a diagram of the optical arrangement used in Figs. 1 and 2; and

Fig. 4 is a diagram of the printing drum and the operating motor.

The present invention comprises a motion picture film, preferably the small size commercial film; having addresses or picture subjects thereon which are transferred by photographic enlargement to a corresponding paper band which is completed in the usual way, the band may be cut to separate each picture, and, these separate portions of the band may be applied to separate envelopes whereby the envelope is fully addressed and is completed for mailing purposes. In practice it is found that the motion picture film, by reducing the size of the address, can store a large number of addresses in a convenient and

small compass, and, when it is necessary to change an address, the operation is readily performed by splicing the film, or by adding new addresses to the end.

To make these addresses usable they must be enlarged and they must be transferred to paper stock. The preferred way of carrying this out is to provide a paper band, enlarged to correspond with the enlargement of the picture over the film, and to print directly from the film upon this band by projection the subject of each frame. The paper band may be previously emulsified and stored on a reel to be used when necessary in the printing process, or it may be emulsified at the time it is used. After the printing is completed the paper band is taken through a developing and fixing bath and through an electric heating coil from which it may be stored on a reel until required.

The photographic materials that are commercially available indicate that a photo-sensitive material that can be rapidly printed requires considerable time in developing, and, on the other hand, a photographic emulsion that is comparatively slow in printing can be developed rapidly. It is the purpose of the invention, when slow printing paper is used, to increase the time of exposure without slowing up the operation of the system, and, on the other hand, when slow developing paper is used, provision is made for increasing the developing time for each picture without impairing the speed of operation of the system.

The time of exposure for slow printing paper is increased by the use of a printing wheel which comprises a small drum upon which the film is wound, and a large drum spaced from the small drum upon which the paper band is wound as the wheel rotates. A source of illumination is provided in the center of the small drum which projects a light beam through the film as an enlarged picture upon the paper, and this condition is maintained for practically a revolution of the wheel, so that all the pictures on the wheel are exposed during the time of one revolution although the pictures are fed to and taken from the wheel at a comparatively high speed.

The printing wheel

Referring to the drawings, 11 is the cover of the printing wheel, and 12 is the cylindrical cover for the sides of this wheel making a housing in which the paper drum 13 rotates at 14. The paper drum is provided with a series of windows or apertures indicated at 15 and through which a portion of

the paper band is exposed for printing purposes. The drum 13 is radially divided by the walls 16a into compartments 16, which are enclosed at the inner end by the wall 17 and which open into the windows 15.

18 is the paper band which passes over roller 19 and roller 20 and around the drum 13 and passes out over roller 21. This band is held in position by the ledge 22 of the drum. The small drum 25 for the motion picture film 26 is mounted axially below the drum 13 and rotates therewith. The motion picture film 26 is fed over roller 27 and roller 28 to the drum 25 and takes off over roller 29. The portion of the drum where the film is fed to the drums is not used for printing purposes and in order to prevent falsely exposing the paper at this point a shield 37, Fig. 1, shuts off the light. This shield is supported on a fixed support with the light or source of illumination 31. The light from 31 passes through a condenser lens 32 opposite each light compartment and through a window in drum 25 opposite the picture frame 33 of the film to the prism 34 which deflects the light vertically, Fig. 3, to prism 35 located in the chamber 16 of drum 13, and from this prism, by lens 36 the picture is focused upon the exposed portion of the paper 18 opposite the window 15 in each compartment. The cover of the drum encloses the small drum 25 and provides space for the annular row of prisms 34 as indicated at 30. The rollers and the drum over which the film passes may be provided with teeth to engage the film as commonly used in motion picture machines.

It will be observed that since the drum carrying the paper and the drum carrying the film move together on the printing wheel, there is no relative motion between these parts during the printing operation and the printing is continued from the central source of illumination which is fixed in the center of drum 25 throughout the entire revolution of the wheel, except for the period that is shielded opposite shield 37. It is apparent that by increasing the number of compartments in the printing wheel the number of exposures per revolution will be increased and the wheel may rotate at a slower speed for delivering a given number of pictures; hence the system can be constructed to give any predetermined time exposure desired without slowing up the number of pictures delivered in a given time.

In Fig. 4, the motor 41, through worm 42 and worm wheel 43 rotates the drums 13 and 25, and through the pulley 14a and the belt 44, the take-up reel 45 of the film 26 is rotated. The film is payed-out from reel 46. The paper band 18 is taken from the storage reel 47 through the light-proof housing 50, to the printing wheel 11. After printing in the wheel as described, the paper band is returned in the light-proof housing 50' to be used as desired.

Having thus described my invention, I claim:

1. A system for printing photographic enlargements comprising a printing wheel with a drum for receiving a motion picture film and having a source of illumination in the center thereof, in combination with an enlarged drum for receiving a band of printing paper and located on the axis

of the film drum but on a different plane therefrom, and means for projecting light from said source through said film, upon said band, as said wheel rotates.

2. A system for printing photographic enlargements comprising a printing wheel with a drum for receiving a motion picture film and having a source of illumination in the center thereof, in combination with an enlarged drum for receiving a band of printing paper and located on the axis of the film drum but on a different plane therefrom, and radially divided into light-tight compartments with windows at the outer end through which the printing surface of the paper band is exposed, and means for projecting light from said source through said film upon said band as said wheel rotates.

3. A process for printing enlargements from motion picture films comprising a printing wheel having a drum for the film and an enlarged drum for a band of printing paper said drums rotating on the same axis but on different planes, means for applying the paper and the film to the drums as they rotate, means for taking off the paper and film, and means for exposing separately a plurality of pictures each for substantially a revolution of the wheel for printing as the wheel rotates.

4. Means for printing the individual pictures on a photographic film, comprising a printing wheel having a drum for the film and a drum for the printing paper said drums rotating on the same axis but on different planes, means for applying a band of paper and the film to the drums as the wheel rotates, means for taking off the paper and the film, a fixed source of illumination in the center of the film drum and means for simultaneously printing separately a plurality of the pictures of the film on a corresponding portion of the paper as the wheel rotates for substantially a revolution.

5. In combination, a first drum radially divided into compartments with a window radially aligned in each compartment, means for applying sensitized paper opposite the window of each compartment, a smaller drum rotating about the same axis as the first drum but on a different plane and having radially spaced windows, a motion picture film applied to the outside of said smaller drum with the frames of the film registering with said windows and a fixed source of illumination in the center of said smaller drum projecting the picture of each frame upon the paper as the drums rotate.

6. In combination, a first drum radially divided into compartments with a window in the periphery of each compartment, means for applying sensitized paper to each window, a smaller drum rotating about the same axis as the first drum but on a different plane and having radially spaced windows in its periphery, means for continuously applying a motion picture film to said smaller drum as it rotates with each frame of the film in register with a window of the drum, a fixed source of illumination in the center of the smaller drum and an optical system projecting the picture of each frame upon the paper as the drums rotate.

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