

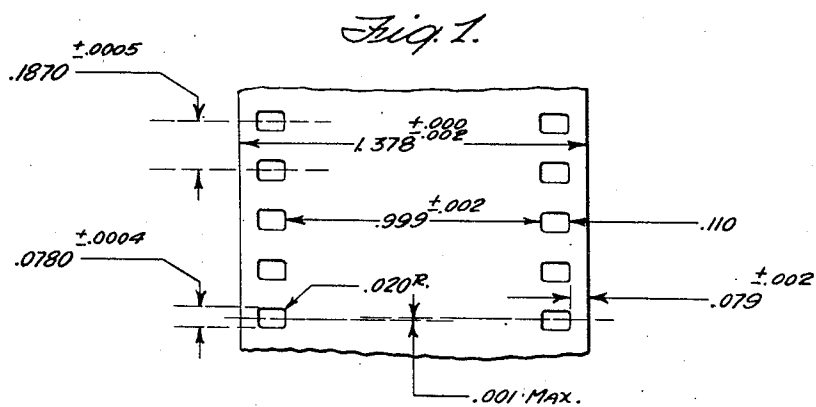
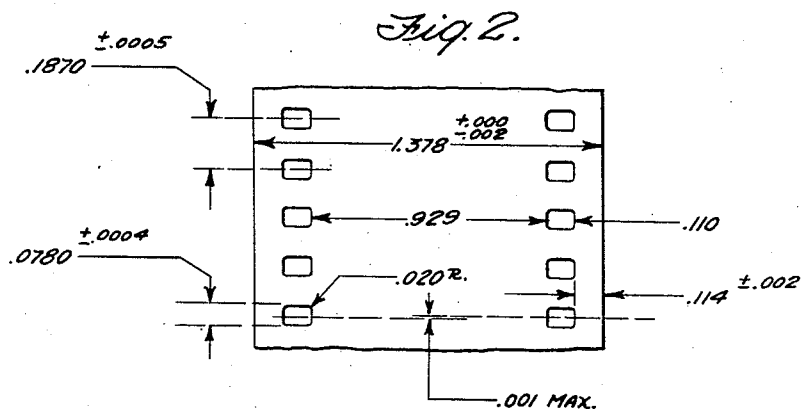
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CONSTRUCTION OF SOUND RECORD FILM

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CONSTRUCTION OF SOUND RECORD FILM

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2 Claims. (Cl. 274-43)

This invention relates to a film upon which sound may be recorded and from which sound may be reproduced. It relates particularly to a film which is perforated near its edges and in which the two ends are joined together so that the film is a continuous one.

The primary object of the invention is to provide a film of this character in which the number of tracks and the space between the perforations and edges of the film bear such relation to each other that a film of standard width will stand the greatest average amount of use.

In a standard film of 35 mm. in width, it is entirely practical to produce sound tracks with a stylus, which tracks may be so close together that 120 of them to the inch may be recorded side by side without danger of one sound track interfering with another. Such tracks in a celluloid film are more permanent than the film itself. That is to say the total playings the track will stand without wearing out the track beds, is greater than the number of times the film will go through the machine without wearing out or breaking.

In a machine using a continuous film such as here contemplated, the entire film goes over the various feed rolls and sprocket each time one sound track is recorded or reproduced. As the number of tracks multiplies, the amount of wear on the film increases, hence the factor of wear becomes important in determining the width of film which will allow the greatest average amount of use.

If a wide film is used, a great many tracks are available, but the film will wear out before all of the tracks are utilized. If, on the other hand, the film is made quite narrow, there is a loss of economy in the utilizable space because whether a film is wide or narrow, there must necessarily be two outer marginal edges, two rows of perforations and two margins within the perforations whether a few tracks are used or many.

In the standard film such as employed in the moving picture industry, the point of greatest weakness lies between the outer edges of the film and the corners of the perforations. The first breaks to occur when a film of this character is put to a break-down test, extend across the narrow strip between the perforations and the outer edge.

A feature of the present invention relates to a film construction wherein that portion of the film between the outer edges of the perforations and the edges of the film is made wider than the

same portions in a standard film of standard width.

In the drawing, Figure 1, is a small portion of a standard 35 mm. film; and

Figure 2 is a similar view of a film constructed in accordance with the present invention.

In a standard 35 mm. motion picture film, the distance between the edge of the perforations and the edge of the film is .0795".

In the film of the present invention, shown in Figure 2, this width is increased to .114"; the difference being .035" or 44%. By reinforcing the edge of the film by the above amount and with standard perforations, such a film can with safety be relied upon to run through the recording machine 3500 times.

The number of sound tracks which it is most advantageous to record on a given piece of film will of course depend upon the average number of times which each sound track is played and this of course will depend upon the nature of the recordings, the taste of the user and the nature of the use of the recordings, whether for pleasure, information or education, it being apparent that it is futile to put more tracks on the film than can be successfully utilized before the film breaks down.

The average of a number of studies of this subject indicates that the number of desired playings per track is 36.08. Therefore, if the total number of playings which the film will stand is equal to 3500 and the average number of times each track is played is 36.08 then the number of tracks that a 35 mm. film may conveniently accommodate is equal to 97.

Therefore by increasing the width of that portion of the film between the outer edge of its perforations and the edges of the film by 44% as stated above, the film will wear as long as the average number of playings of its 97 sound tracks, is subjected, and without unnecessary waste of available playing space. The standard perforations are .110" wide. Since there are two sets of perforations, one on each edge of the film, the total space occupied by the perforations is .220". As clearly indicated in Figure 2, the width between the perforations and the edge of the film is .114", thus leaving a space available for recordings equal to .929". Of this space 97 tracks at 120 tracks to the inch occupy $96 \times \frac{1}{120} = .804$ inch; .004" being the width of a single track. Allowing a margin of .0625" on either side of the recorded area, the total width of .929" is utilized.

It will thus be seen that the standard 35 mm.

film is capable of operating at maximum usefulness by increasing the width of each of its outer margins by .035", thus diminishing the distance between perforations by twice this amount and leaving room for 97 tracks at 120 tracks per inch. The figure 97 also lends itself to convenient counting of the tracks since the largest number that can be indicated on a two-place counter is 99.

In the foregoing specification reference has been made to a standard film. By such film is meant a film of 35 mm. in width with the size and spacing of the perforations as indicated in

Figure 1. This film is that which has been adopted as standard by the Sound Motion Picture Engineers.

What I claim is:

1. A perforated sound record film of standard width (35 mm.), the distance between the outer edges of its perforations and the edges of the film being of the order of .114".

2. A perforated sound record film of standard width (35 mm.), the distance between the inner edges of its perforations being of the order of .929".

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