1

3,407,093

ELECTRONIC RECORDING FILM
Noboru Masuda, Tokyo, Japan, assignor to Denki Onkyo
Co., Ltd., Tokyo, Japan, a corporation of Japan
No Drawing. Filed Mar. 24, 1965, Ser. No. 442,530
1 Claim. (Cl. 117—201)

ABSTRACT OF THE DISCLOSURE

A recording film for electrostatic recording comprising a film of polyethylene and a coating of a surface treating agent applied on one surface of said film, said surface treating agent consisting of polymethacrylic acid and tin metal in chelate combination.

This invention relates to electronic recording films and more particularly to electronic recording films made of a synthetic resin and treated with a special surface treating agent.

When electrostatically recording signals by accumulating electric charge on a film of a synthetic resin by a direct corona discharge bound electric field will be created on the rear surface of the film of synthetic resin. As a result, if the recording film is removed from the recording machine without any caution the bound electric field would be disturbed to result in a great distortion in the recorded image or picture, thus impairing the quality of the picture. An approach to this problem has been proposed wherein the recording film is removed from the electrode after apparent electric charge has been reduced to zero. By another method the residual charge is neutralized when the recording film is removed. By still another method a substance having a resistivity of less than 10^4 ohms is applied in two layers on the rear surface of the recording film. It has also been proposed to apply an anti-electrostatic paint as the rear surface treating agent which is more economical than the method of using duplicate layers. Most of anti-electrostatic paints or agents to prevent accumulation of electrostatic charge comprise surface active agents. However it was found that these surface active agents greatly affect the quality of pictures because of their aging characteristic. The principal factor that contributes to aging is the penetration of the surface active agent applied on the rear surface of the recording film. Even in a dense recording film made of polyethylene, for instance, the surface active agent may reach the front surface, or the recording surface of the recording film thus rendering impossible to record in the extreme case. Further as these surface active agents utilize moisture as the carrier of ions, or they are electrolytes they are not effective at low humidities.

The object of this invention is to eliminate various defects mentioned above.

A further object of this invention is to provide novel recording films for electrostatic recording which are effective even at lower humidity conditions.

Still further object of this invention is to provide a recording film for electrostatic recording wherein aging of the film caused by penetration of the rear surface treating agent through the film is prevented.

According to this invention the rear surface of a recording film made of an artificial resin is coated by a film of rear surface treating agent consisting of a metal chelate resin.

The following example is given by way of illustration and not limitation.

The substratum of the recording film was made of polyethylene containing less than 10% of lubricant and having a thickness of 0.5 mm. The polyethylene film was molded under as far as low humidity condition to provide smooth surface. One method of synthesizing a rear surface treating agent adapted to be applied on the resin film is as follows:

A small quantity of hydrogen peroxide was added to 100 cc. of methacrylic acid and refluxed at a temperature below 160° C. to synthesize polymethacrylic acid. Ten grams of this polymethacrylic acid was dissolved in 20 cc. of water and the solution was added dropwise to a solution consisting of 10 cc. of water and 20 grams of stannic chloride while 0.1 N caustic soda was added drop after drop. The temperature was maintained in a range of from 40° C. to 120° C. and the mixture was caused to react for one hour while stirring was continued to obtain a colorless transparent compound in which polymethacrylic acid and tin is in chelate combination. This resin solution was diluted with water or alcohol of about 250 times by volume and the diluted resin solution was applied to said polyethylene film to produce a recording film.

The rear surface resistivity of the recording film prepared in this way was less than 10^4 ohms and the rear surface treating agent adheres well to the recording film.

In view of the above, it will be evident that many modifications and variations are possible in light of the above teachings. It therefore is to be understood that within the scope of the appended claims the invention may be practical otherwise than as specifically described.

What is claimed is:

1. A recording film for electrostatic recording comprising a film of polyethylene and a coating of a surface treating agent applied on one surface of said film, said surface treating agent consisting of polymethacrylic acid and tin metal in chelate combination.

References Cited

UNITED STATES PATENTS
3,224,889 12/1965 Schulde et al. -------- 117—201

WILLIAM L. JARVIS, Primary Examiner.