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COMPOSITION FOR SOUND RECORDING DISKS

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1 Claim. (Cl. 260—13)

This invention relates to improved sound recording disks and the like. More particularly it relates to sound recording disks, plates, cylinders or continuous sheets provided with a novel composition of matter adapted to receive sound impressions thereon for transcription and reproduction.

Recording pieces as heretofore used, generally consist of molded materials such as Bakelite, hard rubber, shellac or vinylite or they may have a receptive base consisting of any one or more of the following; brass, aluminum iron hard paper, compressed wood, etc., onto which a film of desirable impressionable material is laid for receiving sound impulses or impressions.

One of the important materials presently used on a metal layer is a film of colored nitro cellulose lacquer having incorporated a suitable plasticizer or suitable softening materials.

The sound tracks on a nitrocellulose record containing a nitrocellulose film are formed by means of a needle which is attached to a diaphragm of a mouth piece, or by means of a magnetically operated recording needle used in connection with a microphone and vacuum tubes to amplify the sound which produce pulsations representing rarefactions in cutting and condensations of the sound waves. In these sound tracks by means of the above or any other present method, there is displaced some of the nitro cellulose or other inflammable coating which may be obtained in the form of a fine filament or thread. This displaced filament or thread increases in amount as the cutting operation progresses. This mass of thread material consisting of nitrocellulose or other inflammable material constitutes a serious fire hazard in recording because of the danger of people smoking or by some other cause such as sparking, friction or the like. In recording, precautions are taken to minimize the fire hazards incidental to the production of such records.

With the above and other disadvantages in view, it is one of the objects of the present invention to provide sound recording receptive materials which are not inflammable.

Another object of the present invention is to provide a durable coating on a receptive base adapted to retain its consistency and grooved appearance after the sound recording operation.

One further object of the present invention is to provide a non-inflammable, novel composition of matter for use in combination with a receptive surface for taking up sound impressions or recordings, and which may be applied by brushing, dipping, spraying or spreading onto a receptive surface.

With the above and other objects in view, the invention generally includes a novel composition of matter containing a non-inflammable cellulose derivative base or a chlorinated rubber base, in combination with a receptive surface of any desired shape or form, and adapted to permit formation of spiral grooves without becoming a fire hazard in the formation of said sound tracks.

In a detailed consideration of the invention, it has been found that ethyl cellulose permits mixing with other substances, even with nitrocellulose, to prevent the burning of the same and without any loss in smoothness or evenness of surface consistency.

As an example of one formula illustrating an important feature of this invention, the following examples may be noted.

A preferred embodiment of the invention may include:

I

	Parts by weight
Lindol (tricresyl phosphate)	16.00
Soya bean oil	3.00
Arochlor (chlorinated diphenyl)	1.50
Ethyl cellulose	78.00
Butyl stearate	1.50
Coloring matter	

The above parts by weight are approximate and may be varied to meet specific requirements. It is to be noted that the coloring matter to be used may be any dye compatible with the above materials as used in the art to obtain any desired color, such as methyl violet, zapon fast red, black *x*—1009.

In making the above composition, the arochlor, soya bean oil, butyl stearate and lindol are warmed together with constant stirring until solution is effected, then the ethyl cellulose is added with continued heating and stirring until a homogeneous mixture is obtained.

Instead of mixing and heating the ingredients together they may be dissolved in the following solution:

	Pounds
Butyl cellosolve	2
Cellosolve acetate	10
Xylol	84
Butyl alcohol	111
Toluol	416

The quantities indicated in the above solution are approximate, and can be varied in any proportions or equivalents may be substituted in any

manner well known in the art. Also, allowances may be made for evaporation, spilling and other losses. In the ethyl cellulose combination given above, other plasticizers may be used; such as, dibutyl phthalate, and other phthalate derivatives, triacetin tributyrin, dibutyl tartrate, tributyl phosphate, sulphonamides, and the like.

Another formula illustrative of the invention is as follows:

II

	Parts by weight
Lindol	17.00
Arochlor	3.00
Ethyl cellulose	77.50
Nitrocellulose	2.50

The substances may be dissolved in well known solvents, comprising equal parts of butyl acetate butyl alcohol and toluol.

Other cellulose derivatives, such as cellulose acetate, cellulose aceto butyrate, cellulose aceto propionate, may be used to produce non-inflammable films when properly plasticized as known in the arts.

It is to be noted that the quantity of nitrocellulose to be used in the formula may be varied as long as the ethyl cellulose or its non-inflammable substitute is added to prevent or inhibit any burning of the nitro-cellulose.

Another type of non-inflammable film used to record sound according to experiments made has been the use of chlorinated rubber properly plasticized by arochlors, Lindol and butyl stearate; for example:

III

	Pounds
Chlorinated rubber	2.00
Dihydro methyl abietate	0.75

The above ingredients may be dissolved in toluol prior to use as is known in the art.

In each of the formulas above given it is to be noted that dyes instead of pigments are used as coloring agents to provide a non-crystalline surface. Any dye color may be used depending upon the type of film to be produced, as heretofore stated.

The quantity of dye used in each of the formulas according to the present invention is very small being about 0.5 to every thousand parts of solid material used by weight.

From the foregoing preferred examples of this invention, a non-inflammable composition may be employed either in the solution or in a plastic condition onto a receptive surface. The composition may be applied by dipping the same, by brushing or spraying solutions of the composition thereon or by spreading it onto the surface. Furthermore, the composition may be specifically applied onto disks, plates, cylinders or continuous sheets of suitable material to form a film thereon with a minimum thickness of about four one thousandths of an inch.

It has been found that a composition of matter as disclosed and used according to the present invention is a smooth homogeneous non-crystalline colloidal mass with a durable surface and which however is sufficiently soft to receive any sound impressions or recordings adapted for use in homes, radio and like transcriptions. When the recording needle cuts into the composition described herein, the resultant thread or filament which accumulates during the formation of the spiral groove in the composition does not constitute a fire hazard.

A product made according to this invention is not only superior to any found in present use for making sound records, but is also more economic to use and safer to manufacture.

Recording films, disks, cylinders or other receptive surfaces having a coating of the composition made in accordance with this invention may be reproduced in any suitable manner, for example electrical transcription.

The tremendous advantage of non-inflammable type of film made according to the present invention is that, such a film is more economical to reuse in case of spoilage when recording by merely stripping the film and redissolving and reapplying same on the original receptive surface. Furthermore, the old type of molded disks were crystalline and not fully suitable in reproducing a fine quality of tone because they were much noisier. Most important is the fact that the nitrocellulose type of coating is extremely undesirable and outlawable in some states because of the fire hazard attendant to sound recording as compared with the present invention which embodies less noise and interference in playing and at the same time producing a non-inflammable thread which is thrown away from the cutting needle when sound is recorded on this type of disk. The thread or filament of the composition disclosed herein is not only non-inflammable, but is thrown clear of the groove during the sound recording operation and can also be wiped toward the center of the record when cutting from the outside in toward the center. A record made in accordance with the present invention in addition to the above noted advantages has little high surface noises and is useful for skilled broadcasting. It is understood that a material made according to the present invention may be used as a film on a recording device, or it may be moulded or produced as a record or disk by high pressure injection processes.

While several preferred forms of the invention have been described, it is to be understood that changes as to material, modes of execution, arrangement of materials may be made without departing from the spirit and scope of the invention of the appended claim.

I claim:

A non-inflammable, durable, non-crystalline composition of matter adapted for applying onto a receptive base comprising the following parts by approximate weights; namely, tricresyl phosphate 16.0, soya bean oil 3.0, chlorinated diphenyl 1.5, butyl stearate 1.5, ethyl cellulose 78, and sufficient dye coloring matter to obtain the desired coloring of the composition.

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