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TABLET BRANDING PROCESS AND TABLET

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ABSTRACT OF THE DISCLOSURE

A process of preparing imprinted tablets is set out whereby ink indicia can be directly applied to an unpolished coating of wax on a tablet core. The wax is applied in an amount of about from 5 to 20 micrograms/tablet.

This application is a continuation-in-part of my copending application Ser. No. 312,323 filed Sept. 30, 1963, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates generally to a process for preparing compressed tablets for the printing of ink indicia thereon. In a more particular aspect this invention relates to the preparation of imprinted tablets by imprinting indicia directly onto an unpolished wax coat adhered to a surface portion of a tablet core by the use of conventional printing inks.

The tablet cores can be composed of edible or non-edible materials. The two most important classes of edible tablet cores are those composed of confectionery materials and those composed of compressed pharmaceutical materials.

It is deemed important to provide such tablets with clearly visible identifying marking in order to prevent spurious imitations and substitutions thereof in commerce.

In accordance with one well known method, the printing of ink indicia on a sugar-coated tablet is accomplished by applying a confectioner's shellac coating over the sugar coating and then imprinting the shellac coating with an ink having a shellac base. Due to the presence of shellac in both the ink and the coat the ink adheres to the coat to produce an acceptable product. However, the nature of the shellac surface is considered undesirable by many pharmaceutical manufacturers in view of its lack of polish or luster. Also, the tacky character of shellac-coated tablets presents a handling problem. For example, such tablets do not readily flow into and do not readily seat properly in accomodating recesses in tablet printing machines.

In an effort to combat the aforementioned difficulties many manufacturers have considered it desirable to apply a polished wax coating, for example, of carnauba wax, to each tablet. In this manner the tablet is provided with a very desirable free-sliding or flowing character, and the desired pharmaceutical elegance is imparted to the tablet. However, the wax coating has not proved entirely satisfactory in that conventional shellac-based inks will not readily adhere to the waxy surface and the markings have a tendency to rub off even after drying on the waxed surface.

One prior art attempt to solve the difficulties of printing on a wax-coated tablet is described in U.S. Pat. No. 2,982,-234 to Ackley and Kane. This patent teaches printing on a polished carnauba wax-coated tablet with a shellac-based ink containing cyclohexane and ammonia. In this method the cyclohexane and ammonia coact with each other to penetrate the wax layer of the tablet so that the ink composition can adhere to the surface of the sugar coating thereunder, rather than to the wax layer.

In contrast to the prior art, the present invention provides a compressed tablet having an unpolished wax-coated surface which is highly receptive to imprinting thereon with any of the present commercially available shellac-based printing inks.

Accordingly, it is an object of the present invention to provide a process for preparing an imprinted tablet having an unpolished, wax-coated surface, the waxed surface being particularly suitable for imprinting with conventional, shellac-based printing inks.

Another object of the invention is to provide a process for preparing an imprinted tablet having legible and durable indicia which does not easily obliterate.

SUMMARY OF THE INVENTION

The edible or non-edible tablet cores aforementioned can be composed of a wide range of materials. The edible materials can be either food substances or pharmaceutical substances, while the non-edible materials can, for example, be test reagents, catalysts, or industrial enzyme mixtures. The primary food substance for such edible tablets are confectionary materials such as chocolate powders. The pharmaceutical cores are generally mixtures of fillers, binders, lubricants, disintegrators and active ingredients. Preferred active ingredients are multivitamin mixtures. All of these tablet cores can preferably be coated with grossing powders and sugar coating syrups to give a smooth outer coat.

The tablet cores can be compressed from such materials in a wide range of sizes. It is usually convenient to produce tablet cores having thicknesses of 0.25 inch to 0.50 inch and diameters or lengths and widths of about 0.25 inch to about 1.0 inch.

A large number of these tablets can be placed in a rotatable tablet coating pan and contacted with a warmed dilute solution of the wax in an appropriate solvent. The coating pan is immediately set in motion, and the rotation is terminated after about 10 to 30 seconds in order to prevent the tablets from becoming polished. The wax-coated tablets are removed from the coating pan and marked with ink indicia by running them through conventional tablet branding machines. The unpolished state of the wax coat has been found to be receptive to conventional ink indicia with which permanent markings can be applied to the tablets. After branding, a protective coating of polished wax or shellac can be applied to the tablets.

An example of this process when applied to 100,000 sugar-coated tablets measuring 0.235 inch thick by 0.360 inch diameter is as follows. A dilute wax solution is made up by warming 0.6 kg. of paraffin wax to its melting point and then dissolving this wax in 100 ml. of a warmed petroleum solvent which consisted mainly of n-heptane. The solvent is heated to a temperature in the range of about from 40° C. to 90° C. prior to adding the melted wax thereto. The tablets are placed in a coating pan and the wax solution poured thereover and the pan is then immediately rotated for about 20 seconds. The pan is then stopped and the tablets are removed and the excess solvent allowed to evaporate prior to branding with ink indicia. At this point the tablets have a dull surface, since the short tumbling time is sufficient only to spread the wax over the surfaces and is insufficient to effect a polishing action of the wax on the tablet surfaces. Due to the small amounts of wax employed the visual appearance of the tablet surfaces is not altered significantly by the coating process.

Since a small volume of the wax solution is employed for a large number of tablets to effect a wetting of the tablets with no appreciable excess of the solution, it is considered that nearly all of the wax in the solution is deposited on the tablet surfaces since these surfaces are the most highly absorbent material present in the coating pan.

The wax coated tablets are then passed through a tablet

branding machine in which they are marked with a conventional ink indicia such as the shellac-based ink set forth in U.S. Pat. No. 3,258,347 to Brown.

Considerable mechanical movement of the tablets is required as they are passed through the branding machine since they must be positioned and aligned with individual recesses before being contacted by the branding roller. This movement is effected by various parts of the machine which come in contact with the tablets. If there is insufficient wax on the tablet surfaces to impart lubricity, the tablets will not be positioned and aligned correctly, but rather will bind up in the machine, chip, break and cause a machine shutdown. It has been found that 5 micrograms of wax/tablet is sufficient to provide the necessary lubricity for both laboratory and production sized branding machines.

Greater amounts of wax up to about 20 micrograms/tablet can be employed with good results. For lubricity alone up to 100 micrograms/tablet of wax is usable. However, at amounts greater than 20 micrograms/tablet the indicia placed on the tablets show a significant rub-off during later handling and bottling. While rub-off increases gradually as the amount of wax is slowly increased it has been found that commercially acceptable marking is retained at the 20 microgram/tablet level.

After the ink indicia has been applied and has set, the tablets are transferred to a conventional rotary polishing pan where they are provided with a protective outer coating of a suitable transparent material such as a polished wax coat. The ink indicia will be clearly visible through this transparent outer coat which functions to protect the tablet against chipping and flaking under normal handling conditions. The outer coat, being polished, imparts a pharmaceutical elegance to the tablet.

If desired, the tablet cores can be given a colored coat prior to application of the unpolished wax layer. Such colored coats can be applied by tumbling the tablets in a dye solution or in a dyed sugar solution. The use of such colored coats allows the use of a greater range of ink indicia, for example, a red dye can be employed in a core coat and the ink applied can be a contrasting color such as yellow or blue.

Another variation which can be practiced for applying the unpolished wax coat is to contact the tablets when resting in a rotary coating pan with the wax solution and then start and stop the pan at short time intervals. This operation is known to the art as "jogging" and can be used in the same manner as the above-described continuous tumbling for distributing the wax over the tablet surfaces. In order to preserve the initial unpolished state this jogging operation is conducted for time periods of only 10 to 30 seconds as is the case with the continuous tumbling.

It will be readily understood by those skilled in the art that the amount of wax solution to be used, the concentration of wax in the coating solution and the time the tablets are allowed to tumble in the coating solution will vary according to such factors as the number of tablets to be coated in any single operation, size of the tablets, and the like. For example, for the wax coating process it is essential that the tablets be allowed to tumble in contact with the wax solution only long enough to cover each tablet with a thin, uniform, unpolished coating of wax. If the tablets are not allowed to tumble long enough, the wax will not sufficiently cover the tablet cores and hence would not be sufficiently distributed to allow the tablets to flow readily through the tablet branding machine. Conversely, if the tumbling is continued for too long a period of time the wax-coated tablets rub together to such an extent that the wax coating takes on a polish or luster which tends to prevent satisfactory bonding of ink indicia thereto in a subsequent printing operations.

Additional waxes which can be used are either the naturally occurring or the synthetic waxes. For example

beeswax and carnauba wax can be employed as well as the preferred paraffin wax. Synthetic waxes such as polyethylene glycol can also be used.

Suitable solvents for the natural waxes include various commercially available petroleum solvents such as Skellysolve C (essentially n-heptane), Chlorothene (a chlorohydrocarbon solvent containing methyl chloroform) and Penolene 643 (chlorohydrocarbon solvent). The preferred solvent of these is Skellysolve C. An alcohol such as ethanol can be used as a solvent for the synthetic waxes.

Other conventional inks which can be used for branding are those shellac-based ink compositions described in U.S. Pat. No. 2,948,626 to Sanders and those manufactured by F. G. Oakie, Inc., Ft. Washington, Pa.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The detailed continuous tumbling process above-described can be advantageously carried out using a batch of 100,000 tablets coated with a dyed sugar coat and a wax solution consisting of 0.64 gram of paraffin wax in 100 ml. of Skellysolve C. The wax solution is poured over the tablets and they are then tumbled for 20 seconds and removed from the coating pan. The excess solvent visible on the surface is evaporated by contact with the air and the unpolished wax-coated tablets are then passed through a branding machine and marked with a conventional shellac-based ink. The ink is dried and the tablets are then given a protective coat of polished wax.

EXAMPLE I

Wax solution:		Amount
Paraffin wax	g.	0.6
N-heptane	ml.	100.0

Ten thousand (10,000) sugar coated tablets measuring 0.235 inch thick by 0.360 inch diameter were placed in a rotary coating pan and 10 ml. of the above wax solution when heated to about 70° C. was evenly distributed thereover by tumbling the tablets for 10 seconds. The tablets were then removed while in an unpolished state and branded in a laboratory branding machine using a shellac-based ink having the composition described in U.S. Pat. No. 3,258,347. The tablets flowed through the branding machine without chipping or breaking and the markings showed no tendency to rub off.

The ink was dried and the tablets were then given a protective polished wax coating by using a more concentrated wax solution and a longer tumbling time.

The paraffin wax used was obtained under the tradename "Eskar"® a product of Standard Oil Company of Indiana. The solvent used was "Skellysolve C"®, a tradename of Skelly Oil Co.

EXAMPLE II

Wax solutions:			Amount
(1)	Polyethylene glycol	g.	0.6
	Ethanol	ml.	100.0
(2)	Beeswax	g.	0.6
	N-heptane	ml.	100.0
(3)	Carnauba wax	g.	0.6
	N-heptane	ml.	100.0
(4)	Paraffin wax	g.	2.0
	N-heptane	ml.	100.0

The process of Example I was repeated using each of the above wax solutions. Solutions (1)–(3) resulted in a coating amount of 6 micrograms/tablet and (4) resulted in a coating amount of 20 micrograms/tablet.

The unpolished wax-coated tablets showed similar characteristics to those set out for the tablets of Example I.

The polyethylene glycol employed was "Carbowax 6000" ® a tradename of Union Carbide Corp. The N-heptane was "Skellysolve C" ®. The paraffin wax was "Eskar" ®.

EXAMPLE III

Wax solution:	Amount
Paraffin wax ----------g. (⅛ fluid oz.)--	2.88
N-heptane ----------ml. (12 fluid oz.)--	354.8

The process of Example I was followed by employing therein the above wax solution to coat 150,000 tablets. The paraffin used was sold under the tradename "Parowax" ® produced by Standard Oil Company of Ohio.

In summary, the present invention is directed to the preparation of an imprinted tablet having an unpolished wax coat which has been found to be particularly receptive to imprinting of indicia thereon with the use of convention printing ink.

What is claimed is:

1. In a process for preparing imprinted tablets comprising:

forming compressed tablet cores,

contacting and coating said tablet cores with a wax in a rotatable tablet coating pan,

and then imprinting the resulting wax-coated tablet cores with ink indicia,

the improvement which comprises terminating said contacting after about 10 to 30 seconds in order to prevent the tablets from becoming polished.

2. A process according to claim 1 wherein said wax is dissolved in a volatile solvent when applied to said tablets.

3. A process according to claim 1 wherein said wax is selected from the class consisting of paraffin wax, beeswax, carnauba wax, and polyethylene glycol.

4. A process according to claim 1 wherein said tablet core contains a confectionery material and said wax is an edible wax.

5. A tablet produced according to the process of claim 1.

6. A tablet according to claim 5 wherein said wax is selected from the class consisting of paraffin wax, beeswax, carnauba wax, and polyethylene glycol.

7. A tablet according to claim 5 wherein said tablet core contains a confectionery material and said wax is an edible wax.

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