

APPARATUS FOR COATING RECORDED DISCS WITH A LUBRICANT

This is a continuation of application Ser. No. 319,920, 5
filed Nov. 10, 1981, now abandoned.

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for 10
coating recorded discs with a lubricant and particularly
to an apparatus for creating droplets of the lubricant.

There has been developed recently a high density 15
recorded disc, e.g., a video disc, in which the recorded
information is in the form of a surface relief pattern
formed along an information track in the major surfaces
of the disc. Preferably, the surface relief pattern is
formed in a spiral track, which can be a groove, in the 20
major surfaces of the disc. The disc is played back with
a stylus and during playback, the disc is rotated at a
relatively high speed which creates friction between the
playback stylus and the disc surface. In order to reduce
these frictional forces and to prevent wear of the stylus
and/or the record, it is desirable to provide a layer of
lubricant on the surface of the disc. The lubricant
should be uniformly coated over the entire surface of 25
the disc but should be a thin layer, preferably between
200 and 300 Angstroms in thickness, so that it does not
interfere with the proper playback of the disc. A suitable
lubricant is described in U.S. Pat. No. 4,275,101,
Wang et al.

Because of the viscosity of the lubricant, it has been 30
found difficult to achieve the desired thin, uniform coating
of the lubricant on the disc. One technique which
has been developed is to apply the lubricant in solution
in heptane. The lubricant is mixed with heptane, about
0.3 part of lubricant to 100 parts of heptane. The solution
is then sprayed onto the surfaces of the disc by
passing the disc under a series of oscillating nozzles
which apply the solution. Each side of the disc is coated 35
separately.

In order to eliminate the use of the heptane, which is 40
expensive, toxic, flammable and explosive, another
coating technique has been developed which is described
in the copending application of Brian Ernest Lock, Ser. No. 190,079,
filed Sept. 23, 1980, entitled 45
**METHOD AND APPARATUS FOR COATING
RECORDED DISCS WITH A LUBRICANT** now
U.S. Pat. No. 4,309,456, issued Jan. 5, 1982. In the coating
technique shown and described in the Lock applica-
tion, streams of air are passed through a layer of the
lubricant in a chamber to create droplets of the lubri-
cant in the chamber supported in the air. The lubricant
droplets are carried by the flow of air through an outlet
opening in the top of the chamber and through suitable 50
pipes to nozzles which are on opposite sides of a path
along which a disc is carried. As the disc passes between
the nozzles, the lubricant droplets are directed against
the surfaces of the disc to provide a thin coating of the
lubricant on the disc.

Lubricants have been developed which are a mixture 55
of materials which are incompatible in that they do not
dissolve in each other. It has been found that the apparatus
of the Lock application for forming the lubricant droplets
does not work well with these incompatible 60
lubricant mixtures. Therefore, it is desirable to have an
apparatus which will satisfactorily form the lubricant
droplets even if the lubricant is such a mixture.

SUMMARY OF THE INVENTION

An apparatus for coating a disc with a thin film of a 5
lubricant includes means for forming droplets of the
lubricant. The lubricant droplet forming means includes
a chamber having two sections which are connected
together along the bottom of the chamber. In one of the
sections is means for forming droplets of the lubricant
and means for emitting air under pressure to cause the
lubricant droplets to flow from the one section into the
other section. An outlet is at the top of the other section
to allow the air carried lubricant droplets to flow out of
the chamber.

BRIEF DESCRIPTION OF THE DRAWING

The FIGURE of the drawing is a schematic showing 10
of a coating apparatus which incorporates the present
invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawing, the coating apparatus of 15
the present invention is generally designated as 10. The
coating apparatus 10 includes a coating chamber 12
having therein a pair of opposed coating nozzles 14, and
an atomizer chamber 16. Droplets of the lubricant are
generated in the atomizer chamber 16 and will flow
through pipes 18 and 20 to the nozzles 14.

The atomizer chamber 16 has a baffle 22 extending 20
thereacross from the top thereof to a point spaced from
the bottom thereof. The baffle 22 divides the atomizer
chamber 16 into an entrance section 24 and an exit section
26 which are connected together along the bottom
of the atomizer chamber 16. At the top of the entrance
section 24 is an atomizer 28. The atomizer 28 may be of
any type which uses air to break up a liquid to generate
fine particles of the liquid, such as sonicor Model
035MB1 made by Sonic Development Corp. of Mah-
wah, N.J. In general, such atomizers include therein
two concentric passages, one for the air and the other
for the liquid. The passages meet at the restricted exit
end of the atomizer so that the air will break up the
liquid to form the particles of the liquid. The atomizer
28 has an air inlet port 30 and a liquid inlet port 32. The
liquid inlet port 32 is connected by a pipe 34 to a reser-
voir 36 of the lubricant. A metering pump 38 is con-
nected in the pipe 34 to provide a controlled supply of
the lubricant from the reservoir 36 to the atomizer 28.
The air inlet port 30 is connected by a pipe 40 to a
supply of compressed air, such as an air compressor (not
shown). Connected to the air pipe 40 is a flow meter 42
and a pressure gauge 44 used to control the flow of the
air to the atomizer 28. This type of atomizer will satis-
factorily generate droplets of the lubricant whether the
lubricant is a single material or a mixture of compatible
or incompatible materials.

The atomizer chamber 16 has an air inlet port 46 55
opening into the entrance section 24 at a level above the
bottom of the baffle 22. The air inlet port 46 is con-
nected by a pipe 48 to the pipe 40 to provide a flow of
air into the section 24 of the atomizer chamber 16. A
control valve 50, flow meter 51 and pressure gauge 53
are provided in the pipe 48 to control the flow of air
into the atomizer chamber 16. A liquid drain outlet 52 is
provided in the bottom of the atomizer chamber 16 at
the bottom of the exit section 26. The liquid drain outlet
52 is connected by a pipe 54 to the reservoir 36. The
pipe 18 for carrying the lubricant droplets to the nozzles