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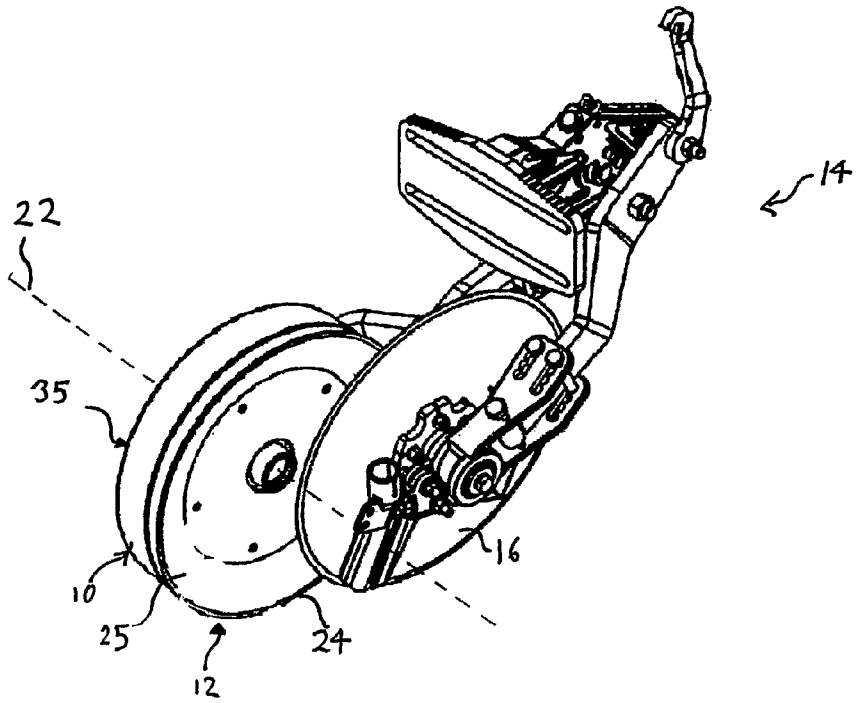
(54) Title: COMBINED ROTARY SCRAPING TOOL AND PRESS WHEEL FOR A COULTER



(57) Abstract: The present invention relates generally to a coulter scraping assembly (10) incorporating a coulter scraping tool (12) which includes a rotary blade (18). The rotary blade (18) is dish-shaped being shallow with a relatively narrow profile and including a narrow working edge (24). The working edge (24) is configured to cooperate with the coulter (16) for scraping excess material, such as soil particles and trash which has built up on the coulter (16).

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COMBINED ROTARY SCRAPING TOOL AND PRESS WHEEL FOR A COULTER

FIELD OF THE INVENTION

The present invention relates generally to a coulter scraping tool and assembly.

BACKGROUND OF THE INVENTION

Agricultural machinery incorporating blades, coulters, tines or other instruments to work soil or cut trash and stubble typically include scrapers to clean the blade or coulter of excess soil or trash/stubble. The scrapers generally take the form of a chisel or fixed blade. Alternatively the scraper blade may be mounted to a gauge wheel so that the scraper and the gauge wheel rotate together. The gauge wheel controls or limits the depth to which the blade, coulter or tine may enter the ground.

SUMMARY OF THE INVENTION

According to one aspect of the present invention there is provided a coulter scraping tool comprising a rotary blade being ground driven and substantially dish-shaped having a relatively narrow working edge adapted to co-operate with a coulter for scraping excess material from the coulter.

Preferably the rotary blade is adapted to connect to a press wheel or gauge wheel.

According to another aspect of the invention, there is provided a coulter scraping assembly comprising:

a press wheel or gauge wheel; and

a rotary blade connected to the press or gauge wheel, the rotary blade being dish-shaped and having a relatively narrow working edge being adapted to cooperate with a coulter for scraping excess material from the coulter.

Preferably the press wheel or gauge wheel includes an outer hub plate and tyre which is sandwiched between the dish-shaped rotary blade and the hub plate.

Preferably the dish-shaped rotary blade is shallow having a relatively narrow profile and is configured at its working edge to present an acute angle to the coulter.

Preferably the rotary blade includes a concave-shaped peripheral surface defining the working edge. Alternatively the peripheral surface is generally flat and sloping, thus shaped in the form of a conical frustum. More preferably the rotary blade is, at the peripheral surface, of a substantially constant wall thickness and thus is designed to maintain its relatively narrow working edge on wearing of the blade.

Preferably the coulter scraping tool includes mounting means connected to the peripheral surface. More preferably the mounting means include a generally flat disc-shaped portion formed inside and integral with the peripheral surface. Still even more preferably the disc-shaped portion includes apertures adapted to receive screws or bolts.

BRIEF DESCRIPTION OF THE FIGURES

In order to achieve a better understanding of the nature of the invention a preferred embodiment of a coulter scraping tool and assembly will now be described, by way of example only, with reference to the accompanying figures in which:

Figure 1 is a rear elevational view of a coulter row unit incorporating a preferred embodiment of a coulter scraping assembly including a preferred embodiment of a coulter scraping tool according to the present invention;

Figure 2 is a top view of the coulter row unit of figure 1;

Figure 3 is a perspective view of the coulter row unit of figures 1 and 2;

Figure 4 is a side view of the coulter row unit of figures 1 to 3;

Figure 5 is an exploded perspective view of an embodiment of a coulter scraping assembly and

Figure 6 shows various views of another embodiment of the scraping tool.

DETAILED DESCRIPTION OF THE INVENTION/PREFERRED EMBODIMENT

A preferred embodiment of a coulter scraping assembly 10 incorporating a coulter scraping tool 12 is shown in figures 1 to 5. The scraping tool 12 and assembly 10 form part of a coulter row unit generally indicated by the reference numeral 14 and including a coulter 16.

The scraping tool 12 includes a rotary blade 18 which is ground driven. The rotary blade 18 is dish-shaped being shallow with a relatively narrow profile and including a narrow working edge 24. The working edge 24 is configured to cooperate with the coulter 16 for scraping excess material, such as soil particles and trash, which has built up on the coulter 16. The blade 18 has a concave-shaped peripheral surface 25 which faces the coulter 16 and at its perimeter defines the working edge 24. As best shown in figure 4, the diameter of the rotary blade 18 is relatively large and approaching that of the coulter 16.

As best shown in figures 1 and 2 the working edge 24 of the scraping tool 12 cooperates with the coulter 16 by being located adjacent one face of the coulter 16. The working edge 24 scrapes soil and trash off the rotating coulter 16. As the coulter scraping assembly 10 rotates so does the scraping tool 12. In the preferred embodiment, the scraping tool 12 is inclined in relation to the coulter 16, however, the coulter and the tool 12 may be parallel.

Figures 2 to 4 show different views of the coulter row unit of figure 1. These drawings illustrate the angle and disposition of the scraping tool 12 relative to the adjacent coulter 16. The working edge 24 of the dish-shaped scraping tool 12 is designed so that it maintains an acute angle relative to the coulter 16.

As best seen in figure 5, the scraping tool 12 includes mounting means in the form of a flat disc-shaped plate 26 connected or formed integral with the surrounding concave peripheral surface (not visible) of the rotary blade 18. The disc-shaped plate 26 includes apertures such as 30 arranged to receive screws or bolts such as 32. Nuts such as 42 are screwed on to the bolts 32 to keep the scraping assembly 10 together.

The scraping assembly 10 comprises a press wheel or gauge wheel 35 to which the scraping tool 12 is fastened or otherwise secured. The press or gauge wheel 35 includes a tyre 36 which is sandwiched between the disc-shaped plate 26 and an outer hub plate 38. An axle 40 is connected to the outer hub plate 38 and its axis aligns with an imaginary axis 22 passing through the aperture 34 of the scraping tool 12. The press or gauge wheel 35 may also include an inner hub plate 41 which locates between an inner side of the tyre 36 and the scraping tool 12.

Figures 6a to 6c show various views of another embodiment of a coulter scraping tool 100 of the invention. For ease of reference, and in order to avoid repetition, like components of this scraping tool 100 (compared with the previous embodiment) have been designated

with an additional "0". The tool 100 is attached or otherwise fitted to a press or gauge wheel (not shown) in a similar manner to the previous embodiment. The dish-shaped blade 180 has a relatively narrow profile (see figure 6c) and is configured at its working edge 240 to present an acute angle to the coulter. This particular shape and design of the rotary blade 180 means that, on wearing and abrasion of the blade 180, it maintains its relatively narrow working edge 240.

It will be apparent that at least the preferred embodiment of the invention has the following advantages:

the narrow profile of the blade presents a relative narrow working edge to the coulter, which does not encourage the build up of debris between the coulter and the scraper;

as the scraper wears the narrowness of the blade ensures that the working edge will maintain an angle;

the blade can be manufactured from a material of excellent wear characteristics; and

the scraper shows reduced friction because the scraper in presenting a narrow profile face to the coulter lessens the build up of soil and trash between the two.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. For example, the dish-shaped blade need not be concave at its peripheral regions but rather may be generally flat and sloping resembling a conical frustum. The scraping tool may be cast, fabricated and/or machined and lends itself to methods of manufacture commonly used to produce plough discs. The present embodiments are, therefore, to be considered in all respects as illustrative and not restricted.

Claims

1. A coulter scraping tool comprising a rotary blade being ground driven and substantially dish-shaped having a relatively narrow working edge adapted to co-operate with a coulter for scraping excess material from the coulter.

2. A coulter scraping tool as defined in claim 1 being adapted to connect to a press wheel or gauge wheel.

3. A coulter scraping assembly comprising:

a press wheel or gauge wheel; and

a rotary blade connected to the press or gauge wheel, the rotary blade being dish-shaped and having a relatively narrow working edge being adapted to cooperate with a coulter for scraping excess material from the coulter.

4. A coulter scraping assembly as defined in claim 3 wherein the press wheel or gauge wheel includes an outer hub plate and tyre which is sandwiched between the dish-shaped rotary blade and the hub plate.

5. A coulter scraping tool or assembly as defined in any one of the preceding claims respectively wherein the dish-shaped blade is shallow having a relatively narrow profile and is configured at its working edge to present an acute angle to the coulter.

6. A coulter scraping tool or assembly as defined in any one of the preceding claims wherein the rotary blade includes a concave-shaped peripheral surface defining the working edge.

7. A coulter scraping tool or assembly as defined in any one of claims 1 to 5 wherein the peripheral surface is generally flat and sloping, thus shaped in the form of a conical frustum.

8. A coulter scraping tool or assembly as defined in any one of the preceding claims wherein the rotary blade is, at the peripheral surface, of a substantially constant wall thickness and thus is designed to maintain its relatively narrow working edge on wearing of the blade.

9. A coulter scraping tool or assembly as defined in either of claims 6 or 7 wherein the coulter scraping tool includes mounting means connected to the peripheral surface.

10. A coulter scraping tool or assembly as defined in claim 9 wherein the mounting means include a generally flat disc-shaped portion formed inside and integral with the peripheral surface.

11. A coulter scraping tool or assembly as defined in claim 10 wherein the disc-shaped portion includes apertures adapted to receive screws or bolts.

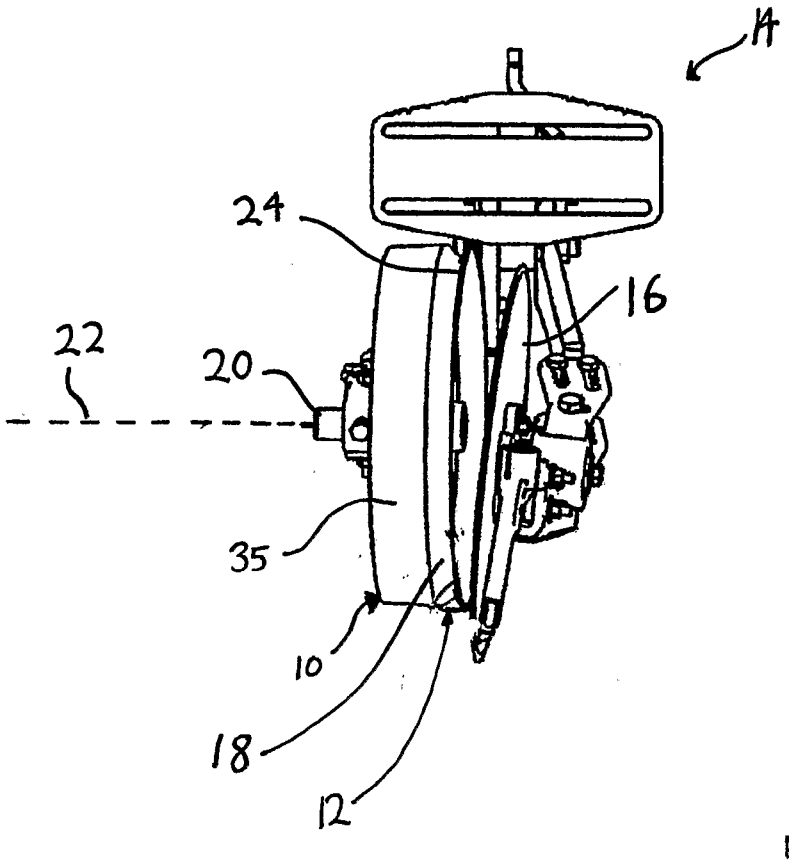


Figure 1

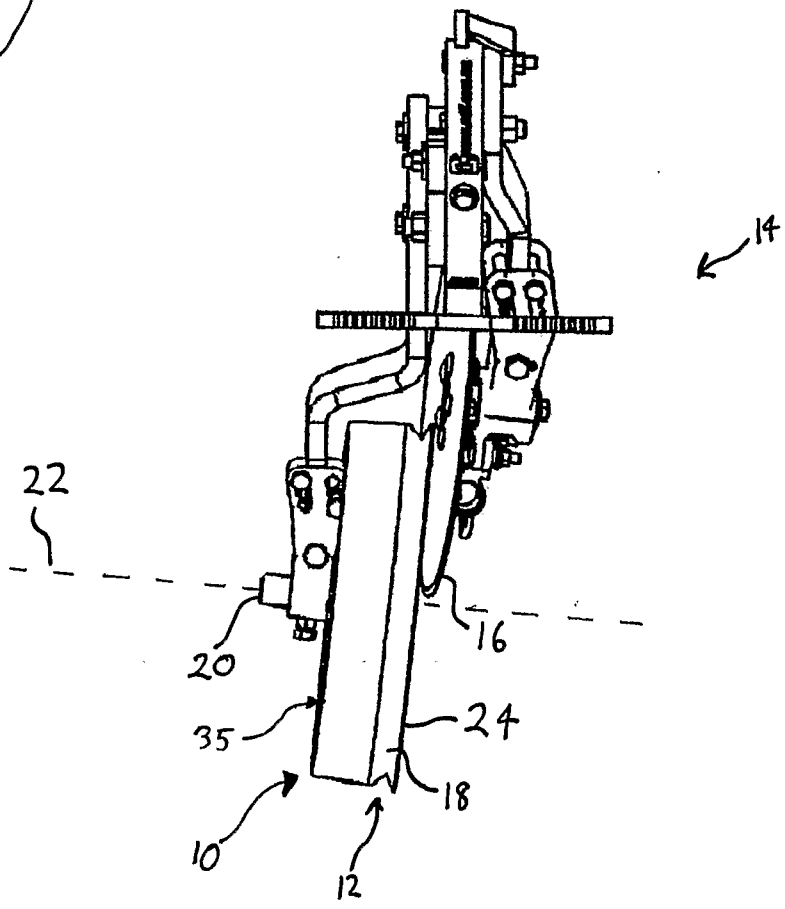
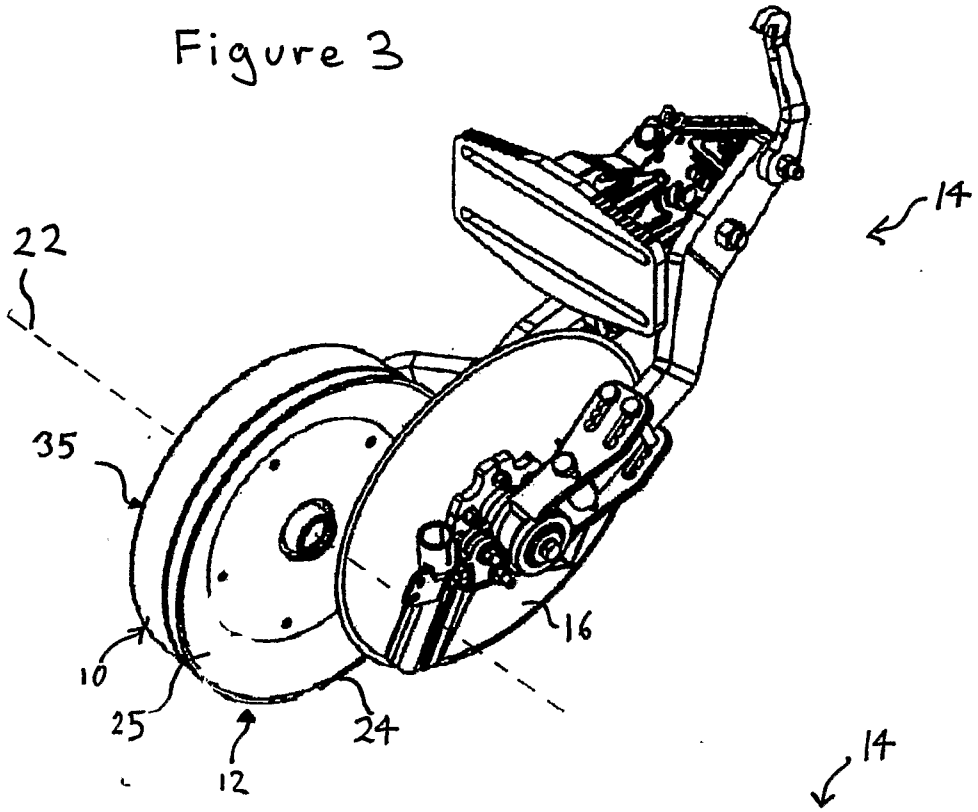


Figure 2

Figure 3



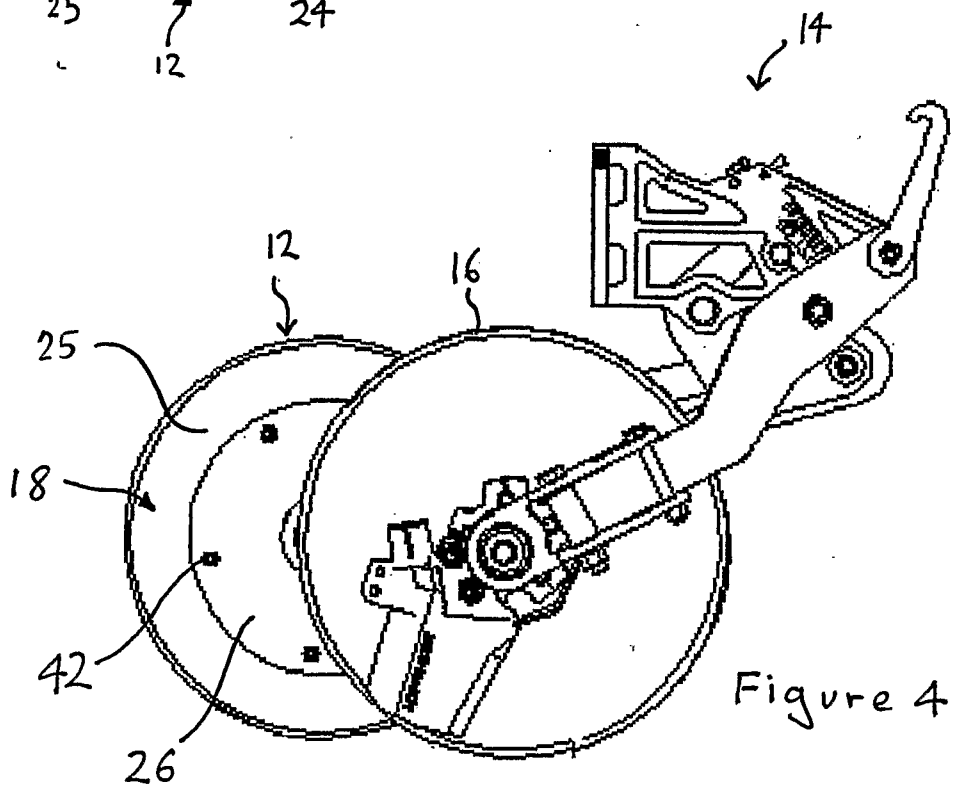


Figure 4

Figure 5

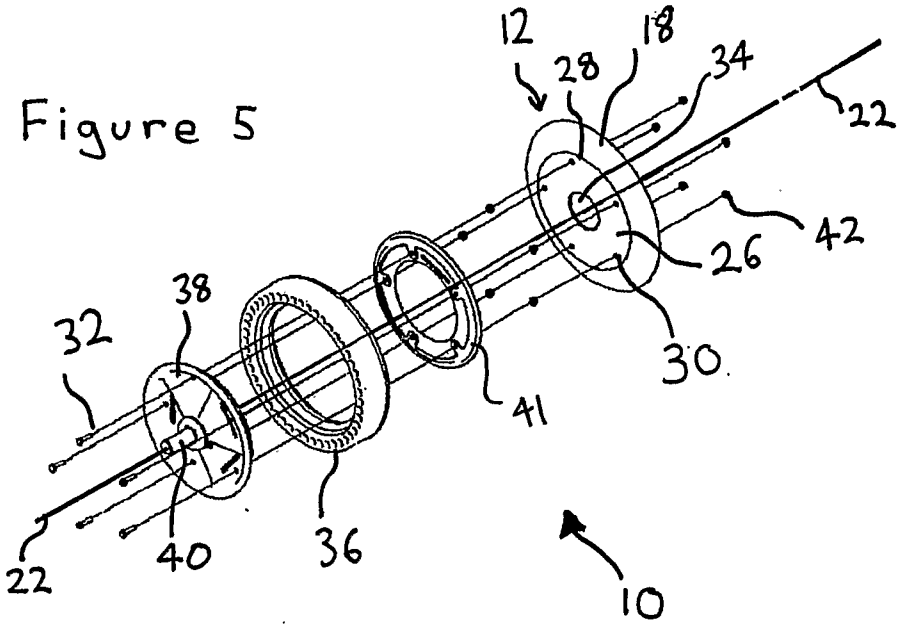


Figure 6b

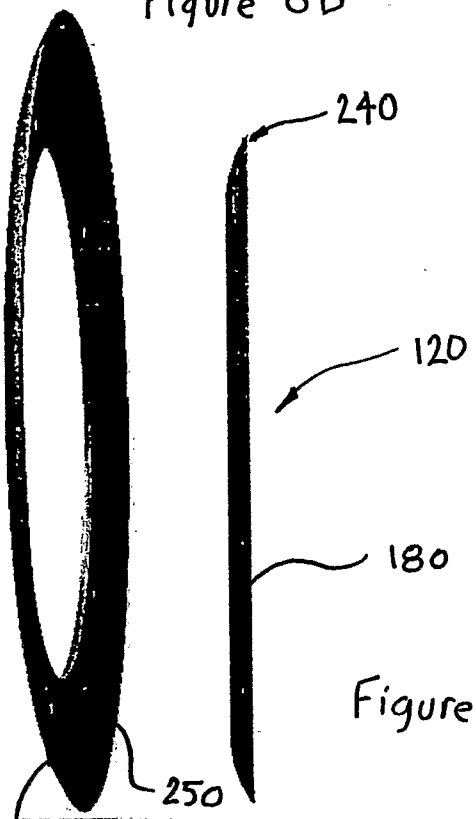


Figure 6c

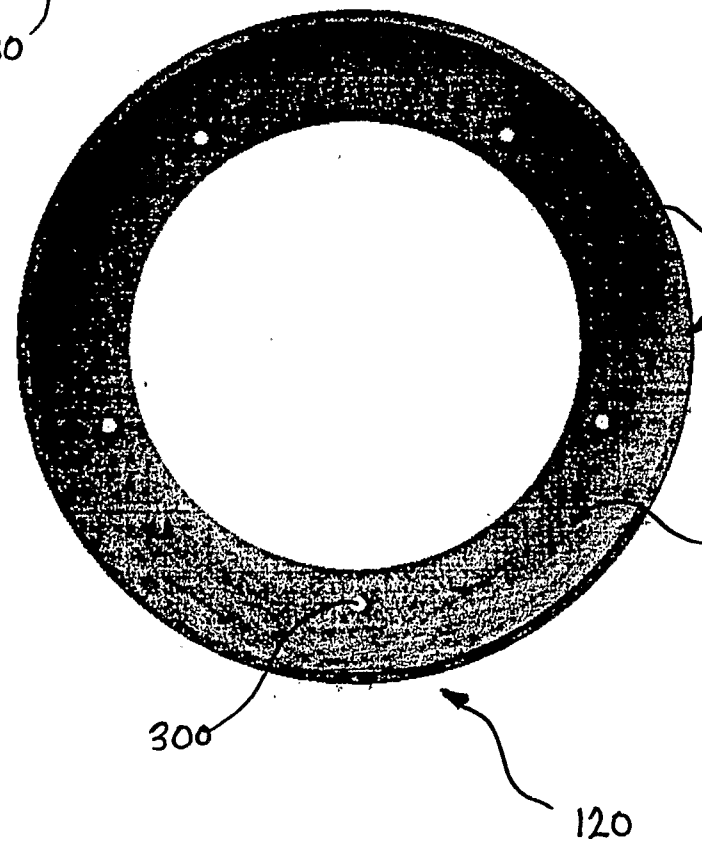



Figure 6a