contained within the utility vault or pit. Heavy covers can cause injury or other back problems to workers during removal and reinstallation of the covers.

Utility vault and pit covers are also made of plastic but these have limited application for use in areas where they are subjected to less load, i.e. green belt or yard applications. The problem with plastic lids is that because they cannot withstand substantial loads, they have limited applicability and plastic lids provide less coefficient of friction when wet versus polymer covers. Consequently a need exists for a new utility vault and pit cover design which is light in weight, yet is durable in that it can withstand substantial loads and provide improved slip resistance over currently available covers.

SUMMARY OF THE INVENTION

According to an aspect of the present invention, there is provided a mold for molding a fiber reinforced polymer material utility vault lid comprising:

a cavity die having a textured surface including a pattern of features at different depths for creating slight protrusions into a surface of the lid to push fibers away from the surface of the lid, creating a resin rich surface;

a core die having a telescoping shear edge for interfacing the core die within the cavity die, wherein the lid is molded between the cavity die and the core die; and

a lid ejection mechanism for removing the molded lid from the mold.

The present invention in an embodiment provides an improved utility vault cover or lid which is manufactured from a fiberglass reinforced polymer matrix material producing a reduced weight and increased strength cover which is lighter, stronger, has improved UV characteristics and slip resistance and is less expensive to manufacture compared to existing cover designs. The lid or cover is used for vaults, pits, chambers or boxes and for ease of presentation shall all be

referred to herein as a vault. Vaults are used in a number of industries including utility, security, gas and rail, for example, where they are underground, buried or at grade level.

The fiberglass reinforced polymer matrix (FRPM) material is a fiber reinforced polymer material which consists of an unsaturated polyester thermosetting resin matrix, glass fiber reinforcement and inorganic or mineral filler. Additional ingredients are low-profile additives including a UV inhibitor, cure initiators, thickeners, process additives and mold release agents. The formulation undergoes a cross linking reaction when cured under heat and pressure. The fiber reinforced polymer material for the cover will retain its original material

WHAT IS CLAIMED IS:

1. A mold for molding a fiber reinforced polymer material utility vault lid comprising:

a cavity die having a textured surface including a pattern of features at different depths for creating slight protrusions into a surface of the lid to push fibers away from the surface of the lid, creating a resin rich surface;

a core die having a telescoping shear edge for interfacing the core die within the cavity die, wherein the lid is molded between the cavity die and the core die; and

a lid ejection mechanism for removing the molded lid from the mold.

2. The mold of claim 1 further comprising means for aligning the cavity die and the core die.

3. The mold of claim 2 wherein the means for aligning are alignment pins and bushings.

4. The mold of claim 1 wherein the telescoped shear edge provides for a gap between the core die and the cavity die to allow air to escape during a molding period.

5. The mold of claim 1 further comprising means to heat and control temperature of the cavity die and the core die.

6. The mold of claim 5 wherein the means to heat and control temperature is a steam pot including internal supports and a sealing plate.

7. The mold of claim 1 wherein the lid ejection mechanism are pins extending through the die core and actuated by a pin plate.

8. The mold of claim 7 wherein the pin plate is hydraulically actuated.

9. The mold of claim 7 wherein the pin plate is mechanically actuated.

10. The mold of claim 1 wherein the textured surface is a corinthian texture.

11. The mold of claim 1 where the die cavity die has recesses for forming bosses on an upper surface of the lid.

12. The mold of claim 11 wherein the recesses are of varying depths.

13. The mold of claim 1, substantially as herein described with reference to any embodiment disclosed.

14. The mold of claim 1, substantially as herein described with reference to any embodiment shown in the accompanying drawings.