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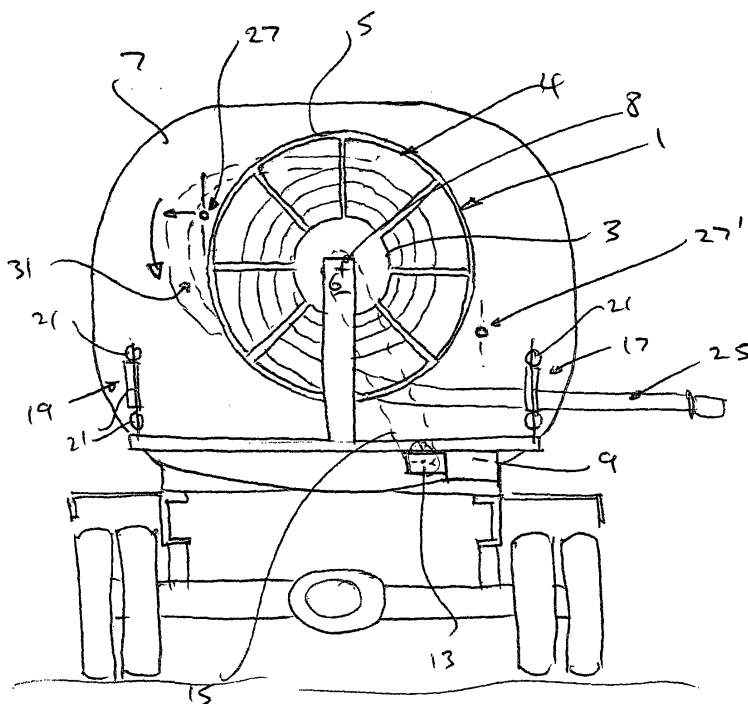
**(54) Hose reel control**

(57) Apparatus comprising a reel (1) journaled for rotation, a flexible hose (25) carried on the reel and a motor (9) for driving the reel via a selectively operable clutch mechanism (13). The reel has an open periphery to permit the hose to be wound on to and off the reel on rotation of the reel. The reel has a play-off direction and a wind-on direction, and the apparatus further comprises a detector (27) to prevent over-run of the reel by en-

gaging the clutch.

The detector may comprise a trigger mechanism placed outside the periphery of the reel and operating to engage the clutch to prevent over-run of the reel when the trigger mechanism detects the presence of hose.

The invention extends to a road tanker having a reel delivery system and fitted with the aforementioned detector.



**FIGURE 1**

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## Description

**[0001]** The present invention relates to hose reel control, especially to the control of hose reels as used on road tankers for the delivery of liquids, such as fuel oils and lubricants, but without limitation to such applications.

**[0002]** The present invention relates to the type of reel containing hose for delivering liquid from a tanker that is provided with a motor driving through an electronically actuated clutch which is such that when the clutch is disengaged, the reel can be rotated manually, for example on pulling the hose, to allow the hose to be played out. Such a reel is usually positioned at one end of the tanker and disposed in a generally vertical plane with its axis of rotation disposed parallel to the longitudinal axis of the tanker. The arrangement is such that, if necessary, the hose can be played out to either side of the tanker but most usually it is played out to the side of the tanker at which the outlet manifold and/or the meter is located. Usually the near side of the vehicle. In practice with a forward mounted reel, the reel will rotate in an anti-clockwise direction when the hose is playing out to the near side.

**[0003]** It has been found that the freewheeling ability of the reel can give rise to a problem with the reel continuing to rotate after the operator stops pulling the hose. This is attributed to the momentum of the reel and as a consequence the hose continues to be discharged from the reel. However, because the hose is relatively heavy and is not particularly slippery the hose does not move where it contacts the ground or other abutment, but is played out where the resistance is least. The problem is particularly pronounced when the hose is being played out on the opposite side of the reel to the side of the reel which moves downwardly on play-out of the reel, although it can also happen to a lesser degree when the hose is being played out from the same side of the hose as that where downward movement takes place.

**[0004]** The present invention aims to provide a solution.

**[0005]** Accordingly, the present invention provides an apparatus comprising a reel journaled for rotation, a flexible hose carried on the reel and a motor for driving the reel via a selectively operable clutch mechanism, the reel having an open periphery to permit the hose to be wound on to and off the reel on rotation of the reel, the reel having a play-off direction and a wind-on direction, and the apparatus further comprising a detector to prevent over-run of the reel by engaging the clutch.

**[0006]** Conveniently, the detector comprises a trigger mechanism placed outside the periphery of the reel and operating to engage the clutch to prevent over-run of the reel when the trigger mechanism detects the presence of hose.

**[0007]** A single detector may be provided for the purpose of detecting unwanted play-out at only one side of

the reel, e.g. for the most common situation. In such a case the detector is placed adjacent that side of the reel which in the case of a vertical reel moves downwardly on play-out of the reel and at that side of the reel that is opposite to the side at which the hose is being played out. It is preferred for the detector to monitor an area of the reel above the axis of rotation for a vertical reel.

**[0008]** Alternatively, respective detectors may be provided to monitor unwanted hose play-out at both sides of the reel. In which case means may be provided to select whether one or both of the detectors are to operate to detect play-out.

**[0009]** The detectors may take a number of alternative forms. For example, in one embodiment it comprises a finger that is pivotally mounted and disposed to lie across the open periphery of the reel and which operates an electronic switch, such as a micro switch, which when activated causes the electronically operated clutch to be engaged. In another embodiment, the detector utilises a light sensing device such as a light emitting diode and corresponding detector which is directed across the open periphery of the reel at a preferred location and which when the light beam passing therebetween is broken causes a signal to be generated that causes the clutch to be engaged. It will be appreciated that other devices that are commonly used to detect the presence or absence of an object could be used as an alternative to the described embodiments.

**[0010]** The problem may also occur with reels which are mounted horizontally to rotate about a vertical axis, and the invention can also be applied to such a configuration by appropriate positioning of the detector according to the side of the reel at which the hose is being played out.

**[0011]** Another aspect of the invention provides a road tanker for deliveries of liquids comprising at least one tank, an outlet line comprising a flexible hose carried on a reel that is rotatable by a motor driving the reel via a selectively operable clutch mechanism, the reel having an open periphery to permit the hose to be wound on to and off the reel on rotation of the reel, the reel having a play-off direction and a wind-on direction, and further comprising a detector to prevent over-run of the reel by engaging the clutch.

**[0012]** The present invention will now be described further, by way of example only, with reference to the accompanying drawing; in which:-

Figure 1 is a schematic end view of one embodiment of apparatus according to the invention, and Figure 2 is a schematic side view of the reel and trigger mechanism of Figure 1.

**[0013]** The drawings show a reel 1 comprising a core 3 and opposite side flanges 4 made from a series of radial members extending between the core and a peripheral member 5. The reel is journaled for rotation with respect to a reel mounting 6. A tanker for the liquid to

be delivered is shown at 7 and is mounted on a wheeled chassis in the illustrated embodiment, but not described in further detail as it is otherwise conventional in the art. The reel is disposed in a vertical plane and rotates about a horizontal axis 8. A motor 9 is provided for driving the reel via an electronically operated electromagnetic clutch 13 and a drive chain or belt 15. The chassis carries hose play-out guides 17, 19 to opposite sides of the reel and these conveniently incorporate rollers 21 to the four sides of a play-out aperture. A hose 25 carried by the reel is shown being played out to the right hand side of the tanker. The play-out direction is denoted by the arrow A. The motor 9 could be a pneumatic, electric or hydraulic motor.

**[0014]** One trigger mechanism for controlling operation of the clutch 13 to prevent freewheeling of the reel is shown at 27. In the illustrated embodiment it comprises a finger 29, and which extends across the open periphery of the reel. The finger is formed as a moveable member of an electronic switch body 30 which is mounted with respect to a fixed part of the tanker, such as the chassis. An electrical signal line (not illustrated) connects into the controls for the electronic clutch.

**[0015]** If over-run of the reel takes place such that the hose moves outside of the periphery of the reel, such as is illustrated at 31 in dotted outline in Figure 1, then the finger is carried with it and its movement activates the switch and causes the electronic clutch be to engaged thus preventing the reel from rotating.

**[0016]** The trigger mechanism operates automatically to over-ride the operation of a separate switch which is provided to control directly whether the clutch is engaged or disengaged and which would have been operated in order to allow hose to be played out from the reel manually.

**[0017]** Figure 1 also illustrates the positioning of a second detector 27', in a position to operate when the hose is played out to the other side of the vehicle.

**[0018]** In such a situation any over run of the reel is likely to result in the hose playing out on the side of the reel which is moving upwardly and because of the weight of the hose will usually occur below the axis of rotation. Accordingly, the over run detector is located outside the periphery of the reel and below the level of the axis of rotation of the reel.

**[0019]** A vehicle may be provided with both detectors 27 and 27' and an operator may select which of the detectors will be effective according to the direction that the hose is being played out. Where the detector comprises a physical trigger which extends across the periphery of the reel, it is preferably mounted so that it can be selectively moved into and out of an operable position. For example, the body may be pivotally mounted, the direction of pivoting will be in a different plane to the pivoting movement of the trigger. For example, moveable in the plane indicated by the arrow B.

**[0020]** In the case of a photocell, or the like, an electric switch may be provided to select operation of the appro-

priate detectors. In some arrangements selection can be automatic say in conjunction with a sensor on the play out aperture, or the positioning of the detectors may be such that both can be effective.

## Claims

1. An apparatus comprising a reel (1) journaled for rotation, a flexible hose (5) carried on the reel and a motor (9) for driving the reel via a selectively operable clutch mechanism (13), the reel having an open periphery to permit the hose to be wound on to and off the reel on rotation of the reel, the reel having a play-off direction and a wind-on direction, and **characterised in that** the apparatus further comprises a detector (27) to prevent over-run of the reel by engaging the clutch.
2. Apparatus as claimed in claim 1 in which the detector comprises a trigger (27) mechanism placed outside the periphery of the reel and operating to engage the clutch to prevent over-run of the reel when the trigger mechanism detects the presence of hose.
3. Apparatus as claimed in claim 1 or 2 in which a single detector is provided for the purpose of detecting unwanted play-out at only one side of the reel.
4. Apparatus as claimed in claim 3 in which the detector is placed adjacent that side of the reel which in the case of a vertical reel moves downwardly on play-out of the reel and at that side of the reel that is opposite to the side at which the hose is being played out.
5. Apparatus as claimed in claims 1 or 2 in which respective detectors (27, 27') are provided to monitor unwanted hose play-out at both sides of the reel.
6. Apparatus as claimed in claim 5 in which means is provided to select whether one or both of the detectors are to operate to detect play-out.
7. Apparatus as claimed in any one of claims 1 to 6 in which the detector the detector is positioned to monitor an area of the reel above the axis of rotation for a vertical reel.
8. Apparatus as claimed in any one of claims 1 to 7 in which the or each detector comprises a finger (29) that is pivotally mounted and disposed to lie across the open periphery of the reel and which operates an electronic switch (30) which when activated causes the clutch to be engaged.
9. Apparatus as claimed in any one of claims 1 to 7 in

which the or each detector utilises a light emitting and sensing means which is directed across the open periphery of the reel at a preferred location and which when the light beam passing therebetween is broken causes a signal to be generated that causes the clutch to be engaged.

10. Apparatus as claimed in claim 1 or 2 when applied to a reel which is mounted horizontally to rotate about a vertical axis.
11. Apparatus as claimed in any one of the preceding claims when applied to a road tanker for the delivery of liquid via said flexible hose.
12. A road tanker for the delivery of liquids comprising at least one tank (7), an outlet line comprising a flexible hose (25) carried on a reel (1) that is rotatable by a motor (9) driving the reel via a selectively operable clutch mechanism (13), the reel having an open periphery to permit the hose to be wound on to and off the reel on rotation of the reel, the reel having a play-off direction and a wind-on direction, and **characterised by** a detector (27) to prevent over-run of the reel by engaging the clutch.
13. Apparatus constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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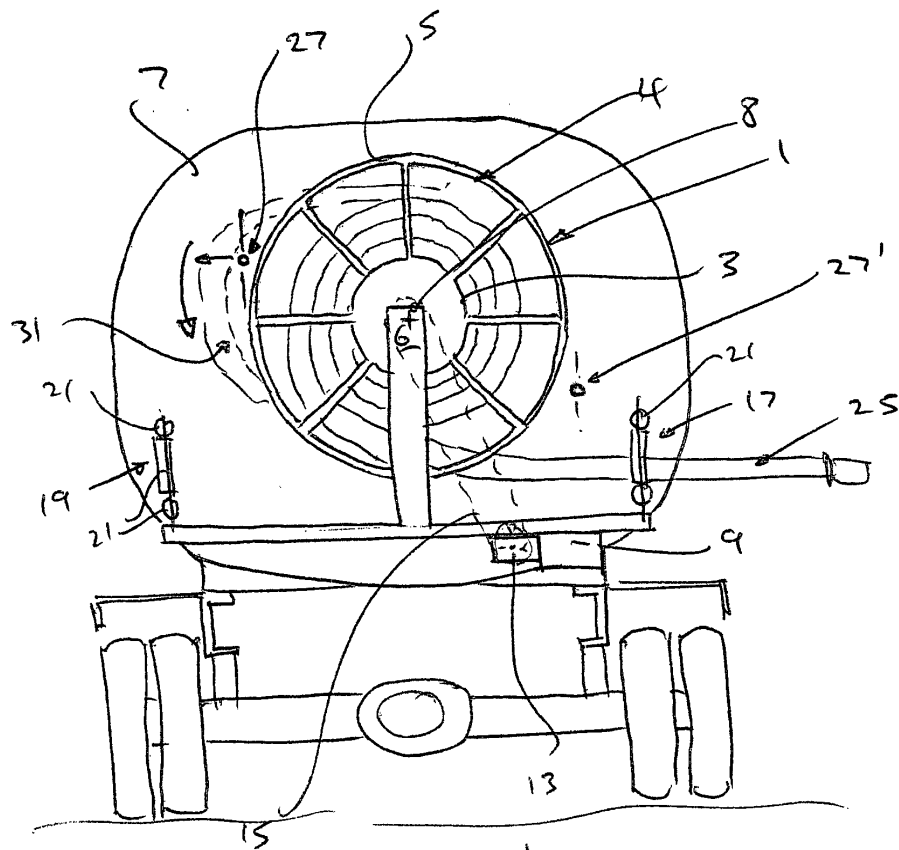


FIGURE 1

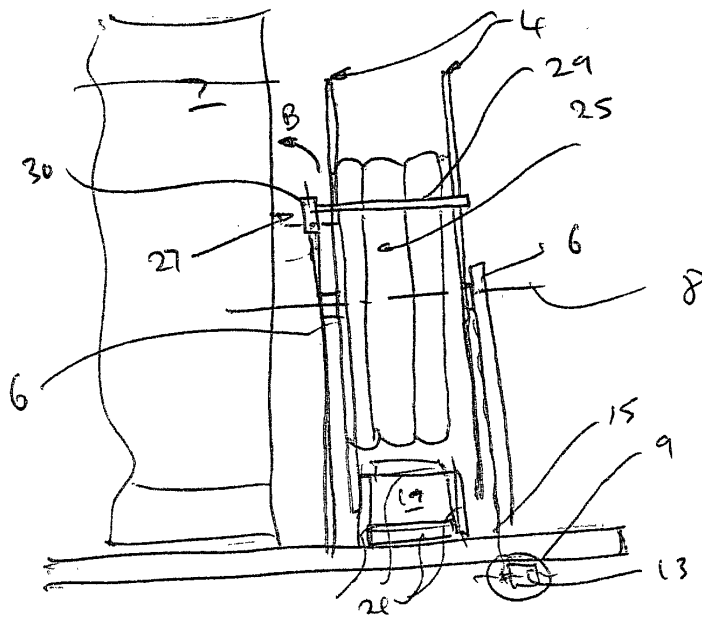


FIGURE 2