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Description

[0001] The present invention relates to hand truck for manual transport of objects which is formed with an outer surface of a material that is magnetisable or magnetic, i.e. a material to which a magnet will stick. Typical examples of such objects are white and brown goods, i.e. washing machines, stoves, refrigerators etc.

[0002] When white or brown goods are transported over relatively short distances a hand truck, like a sack barrow, is often used. Hand trucks are used to transport this type of objects in shops or in ware houses when moving the objects, in private homes when the white goods are delivered on the door by the company selling the white goods and in places where white goods are returned and collected for recycling. These hand trucks are, however, often not designed for bulky and often heavy objects like white and brown goods. As can be seen in figure 1, an operator using a hand truck to transport white goods will often have to assume an awkward position where one is used to hold the object being transported and the operator is left with only one hand to push and steer the hand truck. This is not only uncomfortable, but may also cause damage to the object if that person looses control of the hand truck, which would be very unfortunate if the object to be transported is new. The person using the hand truck may also suffer injuries if he or she looses control of the hand truck or is using the hand truck regularly to transport objects like white and brown goods over an extended period of time, as for example in a work situation.

[0003] A strap may be used to secure the object to the hand truck, but since the objects to be transported by the hand truck usually come in different sizes, a number of straps of slightly different lengths would have to be available. It is also a time consuming operation, therefore straps are not used if the objects are transported over short distances. A flexible strap would not be suitable as the object would not be safely secured to the hand truck.

[0004] In US 5340136 there is disclosed specialized hand truck according to the

features of the preamble of claim 1 for transport of gas cylinders including magnets to hold the gas cylinders. The hand cart further comprises a foot operated release mechanism which includes a pivotable cam. When the cam is rotated it will move along the surface of the gas cylinders scratch the surface of the cylinders. For gas cylinders, which normally find use in industrial environments, this is not a problem. For new items of white goods and similar objects, this is unacceptable. Customers who buy any item of white goods, expect the surfaces to be without scratches, dents or any other visible damage.

[0005] It is therefore an object to provide a hand truck for safe transport of objects with a magnetic or magnetisable surface, and with a release mechanism which does not damage the surface of the object when the object is released.

[0006] This object is solved by a hand truck as defined in independent claim 1, and a use of the hand truck as defined in claim 9. Further preferred embodiments of the hand truck are defined in the dependent claims 2-8.

[0007] There is provided a hand truck for manual transport of an object which, at least in part, is formed with a magnetic or magnetisable outer surface. The hand truck comprises a frame, at least one wheel which is mounted to the frame at a lower part of the frame, and at least one holding magnet for holding the object. The hand truck further comprises a release mechanism which is mounted to the frame where the release mechanism comprises a release member which is movably mounted to the frame of the hand truck. In order to release the object from the at least one holding magnet, i.e. physically separating the object and the at least one magnet until the distance between the at least one holding magnet and the object is so large that the magnetic force between the object and the at least one holding magnet is insufficient for the object to be held by the at least one holding magnet, the following solution may be employed.

[0008] The at least one holding magnet may be attached to the release member and the release member mounted to the frame of the hand truck such that the at least one holding magnet can be pulled backwards while the object rests

against the frame. The release member may be pivotably mounted to the frame of the hand truck. Alternatively the release member may be mounted to the frame of the hand truck such that it follows a linear path when being pulled backwards. Thereby a damage free release of the object is obtained.

[0009] The term "magnetic outer surface" or just "magnetic" is herein used denote a material of the type that a magnet will attach itself to. Fridges, stoves, washing machines and other types of white and brown goods are typical examples of objects which are usually provided with an outer surface in material which a magnet will stick to, but other objects with similar sizes and outer surfaces which attract magnets are equally suitable for transport with the hand truck.

[0010] Normally the hand truck is provided with two wheels arranged on a common shaft, and may also be provided with additional stair climbing wheels if the hand truck is to be used to move objects up and down stairs which may be the case for example when a company delivers white and/or brown goods to a costumer living in a private home.

[0011] The at least one magnet is attached to the release mechanism such that when the hand truck is placed next to an object with an outer surface that is magnetic, the object, like for example an item of white goods, will be attached to the magnet.

[0012] The release mechanism is provided in order to release the object from the magnetic holding force of the holding magnet, which is preferably a permanent magnet. The release mechanism can be designed such that the at least one magnet is pulled away from the object while the object rests against the frame of the hand truck. In order to avoid damage to the surface of the object being transported, the frame may be provided with a plate that the object rests against.

[0013] In an embodiment of the invention the release mechanism comprises a release member which is configured such that the release member is movable

relative to the frame of the hand truck. The release member may be configured such that the release member is rotatable relative to the frame of the hand truck.

[0014] As mentioned, the release mechanism with the release member may be configured such that the release member can undergo a substantially linear movement relative to the frame of the hand truck. Such a release mechanism may comprise a release member arranged in a guide member mounted to the frame of the hand truck. The at least one holding magnet is secured to the release member and the release member is configured such that the release member and the at least one holding magnet can be moved backward away from the object and thereby releasing the object from the holding magnet. To reduce the chance of damaging the surface of the object during release, the release plate may be provided with a soft material like rubber or similar.

[0015] In an embodiment of the invention the release member is rotatably mounted to the frame of the hand truck for example by employing bolts or similar. Hinge means may also be used to provide a rotatable connection of the release member to the frame of the hand truck. It must be emphasized that the release member may take many different shapes.

[0016] In an embodiment of the invention the release member is rotatably mounted to the frame of the hand truck about an axis of rotation where the axis of rotation passes through a lowermost part of the release member and the at least one holding magnet is secured to the release member. In this embodiment the release member is pulled backward in a similar way to what a door would be and the at least one holding magnet is pulled back together with the releasing member. When the release member and the at least one holding magnet is pulled back, the object rests against the frame of the hand truck preventing the object from moving backwards together with the release member and the at least one holding magnet. Thus, the object is released from the holding force of the at least one holding magnet.

[0017] In an embodiment of the invention the hand truck is provided with at least one stop element which limits the movement of the release member. Such a stop member may simply be a small pin or similar attached to the frame of the hand truck. Alternatively the movement limiter may be a spring, a string, a wire or a similar device which is arranged such that the movement of the release member is limited. The hand truck may also be provided with a load carrying plate attached to the lower part of the frame such that it projects forward and can carry some of the weight of the object.

[0018] Other features and advantages of the invention will appear from the description of preferred embodiments of the invention below, with reference to the figures where:

Figure 1 illustrates a user who transports white goods using an ordinary hand truck.

Figure 2 illustrates diagrammatically a first embodiment of the release mechanism according to the present invention.

Figure 3 illustrates an embodiment of the release mechanism providing the release member with a substantially linear movement.

Figure 4-10 shows a further embodiment of the present invention.

[0019] Figure 1 shows a user transporting a white goods apparatus with a hand truck widely available on the market today. As can easily be seen, the working position is not good with respect to injuries or to the safe transport of the white goods.

[0020] In figure 2 there is disclosed an embodiment with a release member 20 provided with three holding magnets 18. Obviously, the number of holding magnets 18 may be varied according to need. The release member 20 is rotatably mounted about an axis A to the frame 12 of a hand truck. The axis A is substan-

tially horizontal when the hand truck is placed on a horizontal floor or on horizontal ground, and passes through a lowermost part 25 of the release member 20. When releasing the object, the release member 20 is pulled backwards at the uppermost part 26 of the release member 20 whereby the holding magnets 18 are also pulled backwards away from the object being transported. When the release member 20, together with the holding magnets 18, are pulled backwards, the object will rest against the frame 12 of the hand truck and the object is thus released from the magnetic holding force of the holding magnets 18.

[0021] In figure 3 there is disclosed an embodiment where the release mechanism is configured such that the release member 20 performs a linear movement. The release member holder 40 is secured to the frame 12 of the hand truck. In the release member holder 40 there is provided a through-going hole adapted to fit the release member 20 which can move back and forth in the through-going hole. At the end of the release member 20 facing the object there is provided a holding magnet 18. In the other end there is provided a knob 42 and preferably a spring in order to urge the release member 20 and the holding magnet to move to its rest position. When the object is released the release member 20 is pulled backward and the object is thus released from the holding force of the holding magnet 18.

[0022] In figures 4-10 the same embodiment of the hand truck 10 is shown from different angles. In this embodiment there is provided four holding magnets 18 which are arranged on the release member 20 such that they are pulled backwards together with the release member 20 when the object 30 is being released from the holding magnets 18. From each view point the hand truck 10 is shown with the magnets 18 in a position where it is capable of holding the object 30, and in a retracted position where the object 30 will be released from the holding power of the holding magnets 18. As can be seen on the figures, the frame in this embodiment of the hand truck is provided with a plate 50 against which the object 30 can rest during transport, thereby reducing the chance of damaging the surface of the object 30 during transport.

Patentkrav

1. Sækkevogn, som omfatter en ramme (12), mindst et hjul (14), som er monteret på rammen (12) ved en nedre del af sidstnævnte, og mindst en holdemagnet (18) til fastholdelse af en genstand, og mindst delvis har en magnetisk eller magnetiserbar yderflade, hvilken sækkevogn yderligere omfatter en udløsermekanisme, som er monteret på rammen (12), og som har en udløserdel (20), der er bevægeligt monteret på nævnte ramme (12),
kendetegnet ved, at mindst en holdemagnet (18) er fastgjort på udløserorganet (20), og at udløserorganet (20) er monteret på sækkevognens ramme (12) på en sådan måde, at den mindst ene holdemagnet (18) kan trækkes bagud, når genstanden hviler mod rammen (12), hvorved genstanden uden nogen beskadigelse kan frigøres.

2. Sækkevogn ifølge krav 1,
kendetegnet ved, at udløserorganet (20) kan bevæges efter en ret linje hen mod og bort fra genstanden.

3. Sækkevogn ifølge krav 2,
kendetegnet ved, at den rette linje er i hovedsagen vinkelret på et plan, som er dannet af sækkevognens ramme (12), der vender mod genstanden, når sidstnævnte holdes ved hjælp af den mindst ene holdemagnet (18).

4. Sækkevogn ifølge krav 1,
kendetegnet ved, at den mindste ene holdemagnet (18) er fastgjort til udløserorganet (20), som er drejeligt monteret på sækkevognens ramme (12).

5. Sækkevogn ifølge krav 4,
kendetegnet ved, at udløserorganet (20) er drejeligt monteret på sækkevognens ramme (12) omkring en akse (A), som går gennem den nederste del af udløserorganet (20).

6. Sækkevogn ifølge et af kravene 1 - 5,

kendetegnet ved, at sækkevognens ramme (12) er forsynet med en plade (50), mod hvilken genstanden kan hvile under transport.

7. Sækkevogn ifølge et af kravene 1 - 6,
kendetegnet ved, at sækkevognen er forsynet med mindst et stoporgan, som kan begrænse udløserorganets (20) bevægelse.

8. Sækkevogn ifølge et af kravene 1 - 7,
kendetegnet ved, at sækkevognen er forsynet med en plade, som er fastgjort til den nedre del af rammen (12) og dette på en sådan måde, at pladen rager fremad, så at den kan bære en del af genstandens vægt.

9. Anvendelse af en sækkevogn ifølge ethvert af kravene 1 - 8 til transport af genstande af hvidevare- og "brunvare"-typen.

FIG. 1

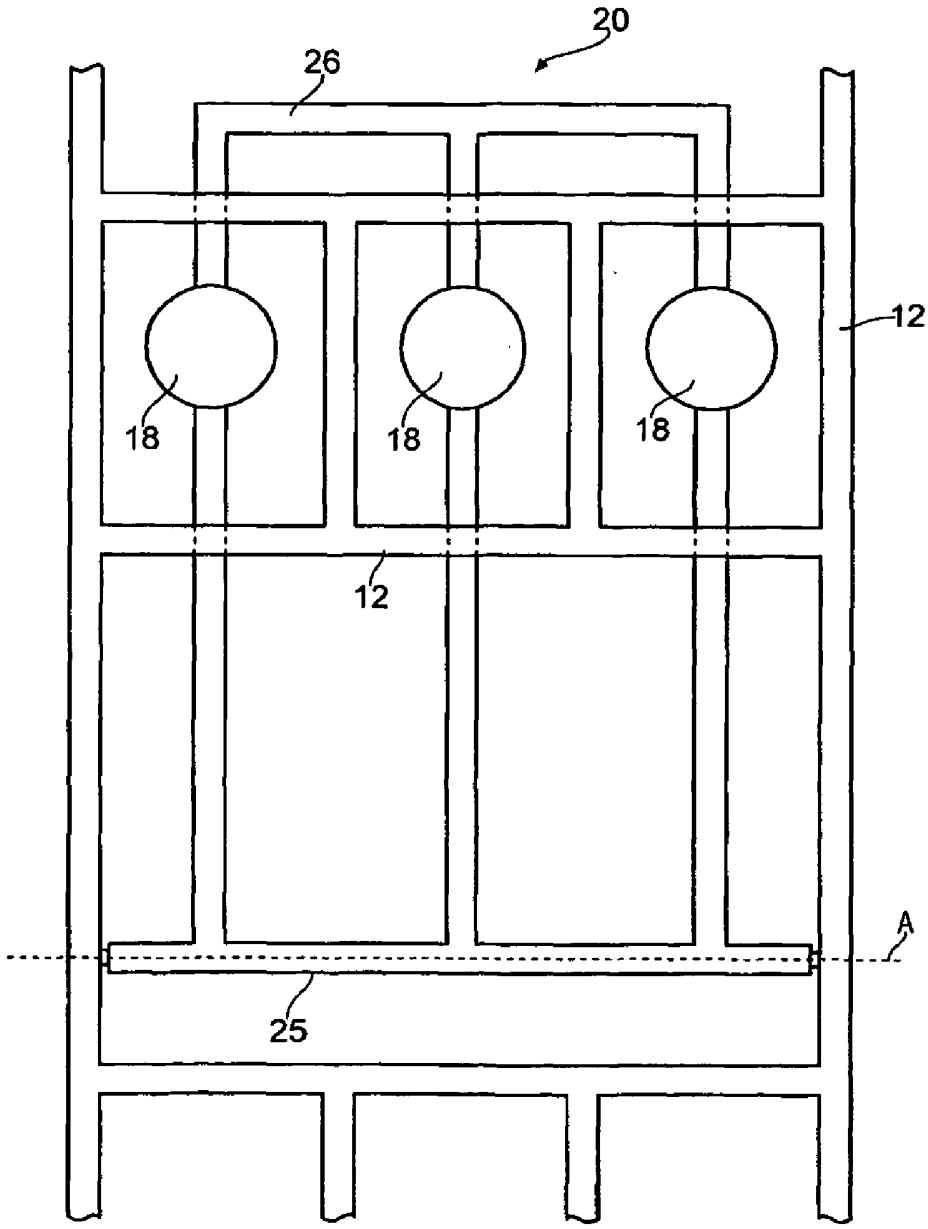

FIG. 2

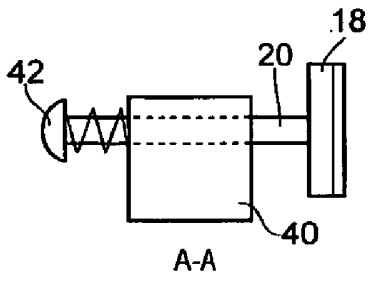

FIG. 3

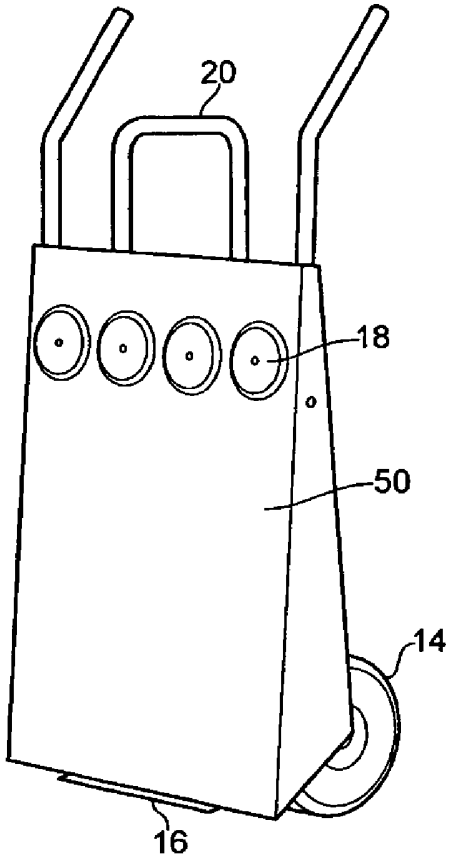

FIG. 4

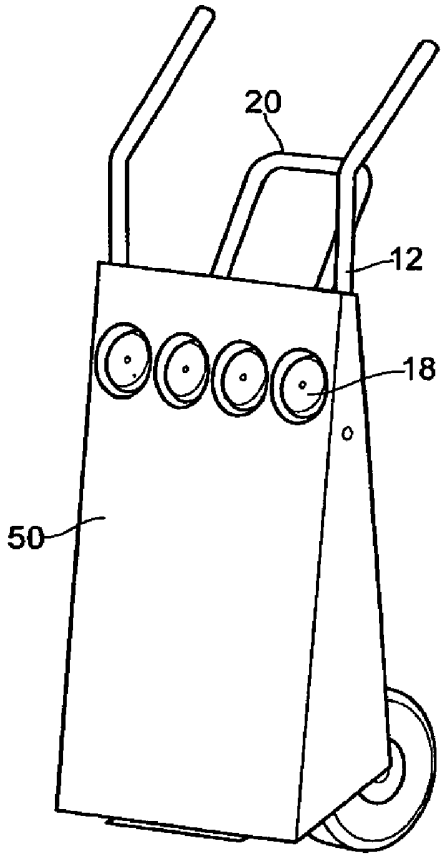

FIG. 5

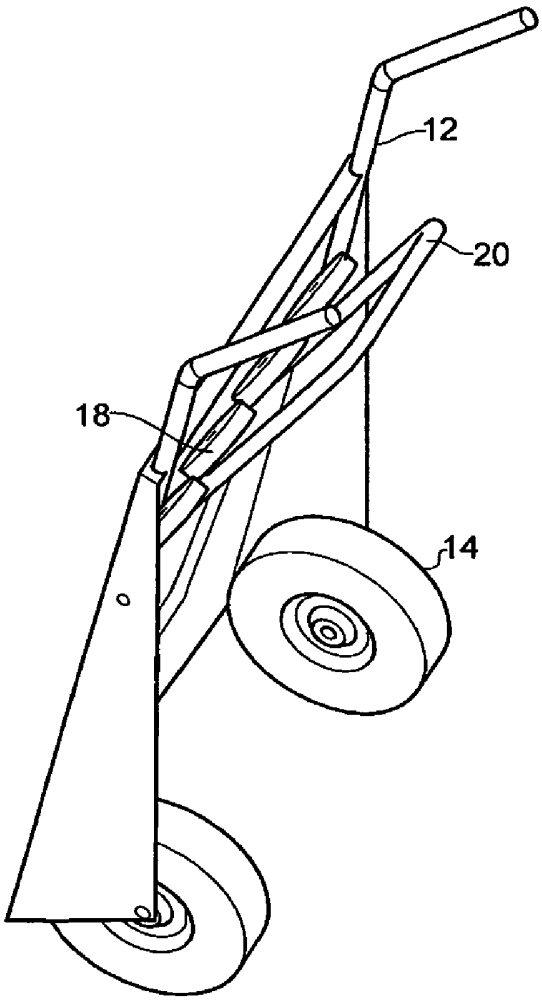

FIG. 6

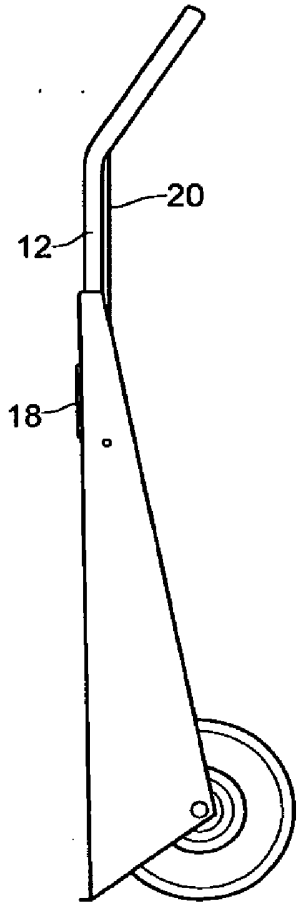

FIG. 7

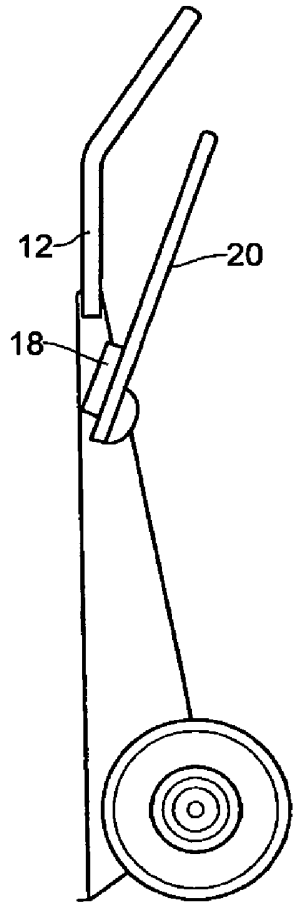

FIG. 8

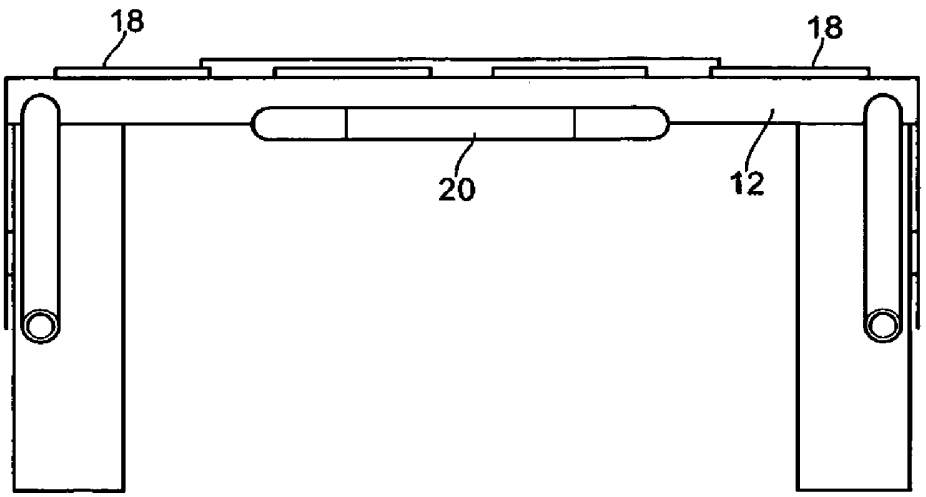

FIG. 9

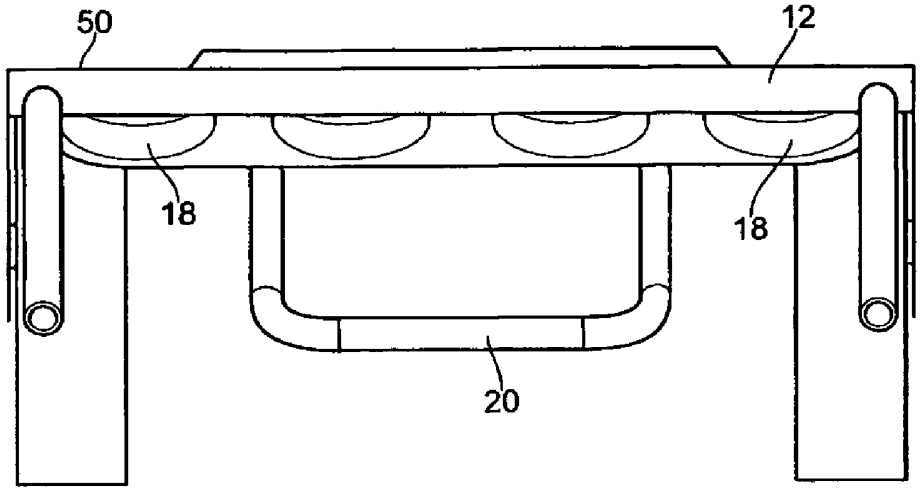

FIG. 10