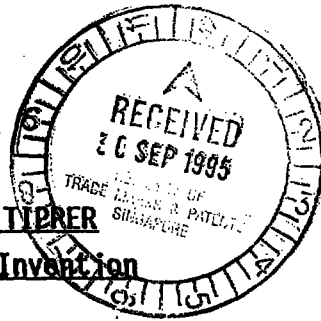


**WHEELED LUGGAGE TIPPER****Background of the Invention****I. Field of the Invention**

The present invention relates generally to a conveyor.

- 5 More particularly, the present invention relates to a conveyor for tipping items, such as wheeled luggage, to a prone position onto a conveyor.

II. Description of the Relevant Art

- 10 Conveyors having a continuous belt for transporting items from a receiving point to a dispensing point are well known. Previous continuous belt conveyors disclose a continuous belt conveyor for transporting cement and other fine-grained particles. Edges of the belt are joined together to form a tubular conveyor to support the cement during transport to a discharge station.

- 15 A troughing type conveyor may be used to transport granular material, such as coal. For instance, a belt conveyor having a U-shaped trough may be equipped with vibrating troughing idler rollers to impart a steady vibration to the conveyor belt causing the coal to migrate toward the center of the belt during conveyance. These types of conveyors are not well suited for many
20 types of items, such as boxes and luggage.

- Also known are belt conveyor systems for use in airport terminals to deliver luggage to and from passengers. In such systems, the luggage is frequently carried sequentially by a number
25 of belts. The luggage is placed on the conveyor system in an upright position by a baggage handler. However, luggage, particularly wheeled luggage, has a tendency to move out of alignment as it is being transferred from belt to belt or fall off the belt while it is being transported through the belt conveyor
30 system. Thus, it would be advantageous to have a conveyor system which would prevent the misalignment or movement of the luggage off the belt.

Summary of the Present Invention

- The invention relates to a conveyor system that
35 orientates an item such as a piece of luggage in a face-down or prone position before the item is fed onto a main conveyor system. The conveyor acts to tip items which are in a relatively unstable position because of a high center of gravity to a more stable

position with a lower center of gravity. Such a conveyor is particularly useful in transporting luggage through airports.

5 The invention comprises a belt conveyor. The conveyor includes a frame having a frame supporting belt for transporting items such as luggage. The V-shaped intermediate section extends between a generally planar receiving and a generally planar discharge section of the conveyor. In the intermediate section, the items on the conveyor are carried at an angle because of the V-shaped trough. Items of luggage which are taller than wide are in
10 an unstable position when supported from below at an angle. Accordingly, such items tip over to the prone or face-down position when travelling through the intermediate section. Pairs of idler rollers are mounted to the frame and angled with respect to each other so as to form the V-shaped trough.

15 The item is then fed to a discharge section in a prone position and transferred onto the main conveyor system in this same position. By tipping the items into a prone position, the user is ensured that the material is discharged onto the main conveyor system in a stable prone position which eliminates misalignment or
20 careening off the side of the conveyor of the items.

Other advantages and features of the present invention will become more apparent from the following detailed description when read in conjunction with the accompany drawings.

Brief Description of the Drawing

25 The present invention will be more fully understood by reference to the following detailed description of the preferred embodiments of the present invention when read in conjunction with the accompanying drawing, in which like reference characters refer to like parts throughout the view, and in which:

30 FIG. 1 is plan view of the conveyor system of the present invention;

FIG. 2 is a fragmentary plan view showing the area of the conveyor system of the present invention that forces the orientation of material in a prone position onto a main conveyor
35 system;

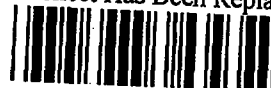


FIG. 3 is a side of a preferred embodiment of the present invention; and

FIG. 4 is a sectional view of the embodiment of Fig. 3.

Detailed Description of a Preferred
Embodiment of the Present Invention

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With reference to Fig. 1, a conveyor 10 particularly suited for tipping an item 40, such as a piece of luggage, is thereshown. The conveyor system 10 includes a main frame 14 having a pair of longitudinally extending parallel spaced rails 16. The
10 conveyor system 10 further includes a continuous belt 18 extending between the parallel spaced rail 16. A power driving assembly is provided within the main frame 14 for moving the belt 18 horizontally about the main frame 14. Although the system shown is particularly suited for luggage, the system may be used for any
15 item which has a relatively high center of gravity in one alignment and a lower, more stable, center of gravity in a second alignment.

The power driving assembly includes a motor (not shown) for driving a drive wheel 20. The drive wheel 20 fictionally engages belt 18 to move the belt about the main frame 14. The belt
20 18 is supported along a path of conveyance 48 by idler rollers 28 and drums 50. The drums 50 rotate freely to guide belt 18 as it is being driven by drive wheel 20. A take-up assembly is provided opposite the drive wheel 20 along the conveyor path 48. The take-up assembly includes three drums 52, 54, 56, each freely rotatable.
25 The take-up assembly provides tension to belt 18. If the belt 18 becomes stretched through use and does not fictionally engage drive wheel 20, take-up assembly drum 52 is moved inwardly toward drive wheel 20 to tighten the slack in belt 18. Take-up assembly drum 52 may also be moved outward away from drive wheel 20 to increase the
30 slack in belt 18, thereby increasing the frictional engagement of belt 18 along the idler rolls 28. Increasing the slack of belt 18 may be necessary to create the V-shaped profile desired to allow material 40 to fall into a prone position.

As shown in Fig. 1, the conveyor includes an in-feed
35 conveyor section 22 extending from one end of the frame 14 for



receiving an item 40. Preferably, the in-feed conveyor section 22 extends along a horizontal plane 34 parallel to spaced rail 16.

The conveyor also includes a discharge conveyor section 24 extending from an opposite end of the main frame 14 for
5 delivering luggage 40 onto a main conveyor system 12 after the luggage has been tipped to a more stable configuration. The discharge conveyor section 24 also extends along a horizontal plane 36 parallel to the spaced rails 16.

An intermediate conveyor section 26 extends between the
10 in-feed conveyor section 22 and the discharge conveyor section 24. As best shown in Figs. 2 and 4, the intermediate conveyor section 26 operates to ensure the item 40 is transferred from the belt conveyor system 10 to the main conveyor system 12 in a prone position by providing a V-shaped section of the belt 18. The V-
15 shaped section has two longitudinal portions which are angled at approximately 140° to each other. The longitudinal portions are supported on a series of troughing roller idler assemblies 28 as shown in Fig. 3.

With reference to Figs. 2 and 4, each idler assembly
20 includes a pair of idler rollers 30. One end of the roll is rotatably mounted in bracket 42 mounted to a side portion of the main frame and an other end is mounted in a lower bracket 44 which is supported on a crosspiece 46 extending perpendicularly between the spaced rails 16. The rollers are mounted on an inclined axis
25 38 of approximately 20 degrees from the horizontal plane. For items such as luggage the 20 degree angle from horizontal ensures that the troughing roller idler assembly 28 will support the continuous belt 18 in a V-shaped contour 32.

With reference to Fig. 1, the preferred embodiment of
30 the conveyor 10 of the present invention is shown in use. The item 40, such as wheeled luggage, is set upon the conveyor 10 at the in-feed section. The wheeled luggage 40 has been set upon the conveyor 10 in an upright position or relatively unstable position.

As the item approaches the intermediate section 26 of
35 the conveyor 10, the continuous belt 18 forms a V-shaped contour 32 defined by the troughing roller idler assemblies 28 due to gravity



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and the weight of the wheeled luggage 40. Luggage which is unstable because of a high center of gravity will fall to either side of the V of the belt and thus travel in a prone position to the discharge section 24.

5 As the luggage 40 approaches the discharge section 24 of the conveyor, the luggage 40 has a tendency to stay in the prone position as it enters the horizontal plane 36 defined by the discharge section 24. As such, luggage 40 is fed onto a main conveyor system 12 in a prone position.

10 Having described my invention, however, many modifications, such as use of driven rollers rather than a belt to move the luggage through a V-shaped section, will become apparent to those skilled in the art. These and other changes are within the spirit of the invention as defined by the scope of the appended
15 claims.

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CLAIMS

1. A conveyor for transporting an item comprising;
a belt;
a frame having an intermediate section, said intermediate section having a support structure for said belt, said support structure forming a V-shaped trough in said belt such that said item being transported on said belt is tipped to a prone position; and
means for driving said belt about said frame.
2. The conveyor as defined in Claim 1, wherein said support structure comprises at least one pair of idler rollers mounted to said frame, each of at least one pair of idler rollers angled with respect to each other to support said belt in said V-shaped trough.
3. The conveyor as set forth in Claim 1, further comprising an in-feed sector disposed upstream from said intermediate section, said belt being generally planar in said in-feed section.
4. The conveyor as set forth in Claim 1, further comprising a discharge section disposed downstream from said intermediate section, said belt being generally planar in said discharge section.
5. The conveyor as set forth in Claim 2, wherein said frame has a longitudinal axis and each of said at least one pair of rollers to said longitudinal axis is mounted at an angle of 20 degrees to a horizontal plane extending through said axis.
6. The conveyor as set forth in Claim 1, wherein said frame further comprises a pair of spaced apart parallel rails.



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7. The conveyor as set forth in claim 2, wherein said at least one pair of rollers comprises a plurality of pairs of rollers.



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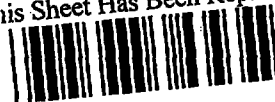
WHEELED LUGGAGE TIPPER

ABSTRACT OF THE DISCLOSURE

The invention relates to a conveyor that ensures the orientation of an item in a prone position when the item is fed onto a main conveyor. By ensuring the orientation of an item in a prone position, the invention can be used to transport luggage or equipment, such as wheeled luggage or golf bags, to an end distribution area. The conveyor provides for an in-feed section, an intermediate section and a discharge section of a conveyor. The in-feed and discharge sections both run parallel to the main support frame of the conveyor and provide a flat area to receive and discharge the material to be transported. The intermediate section extends between the receiving and delivery section and discharge section of the conveyor and has a V-shaped contour so as to tip the item being transported into a prone position.

FIGURE 1

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FIG-1

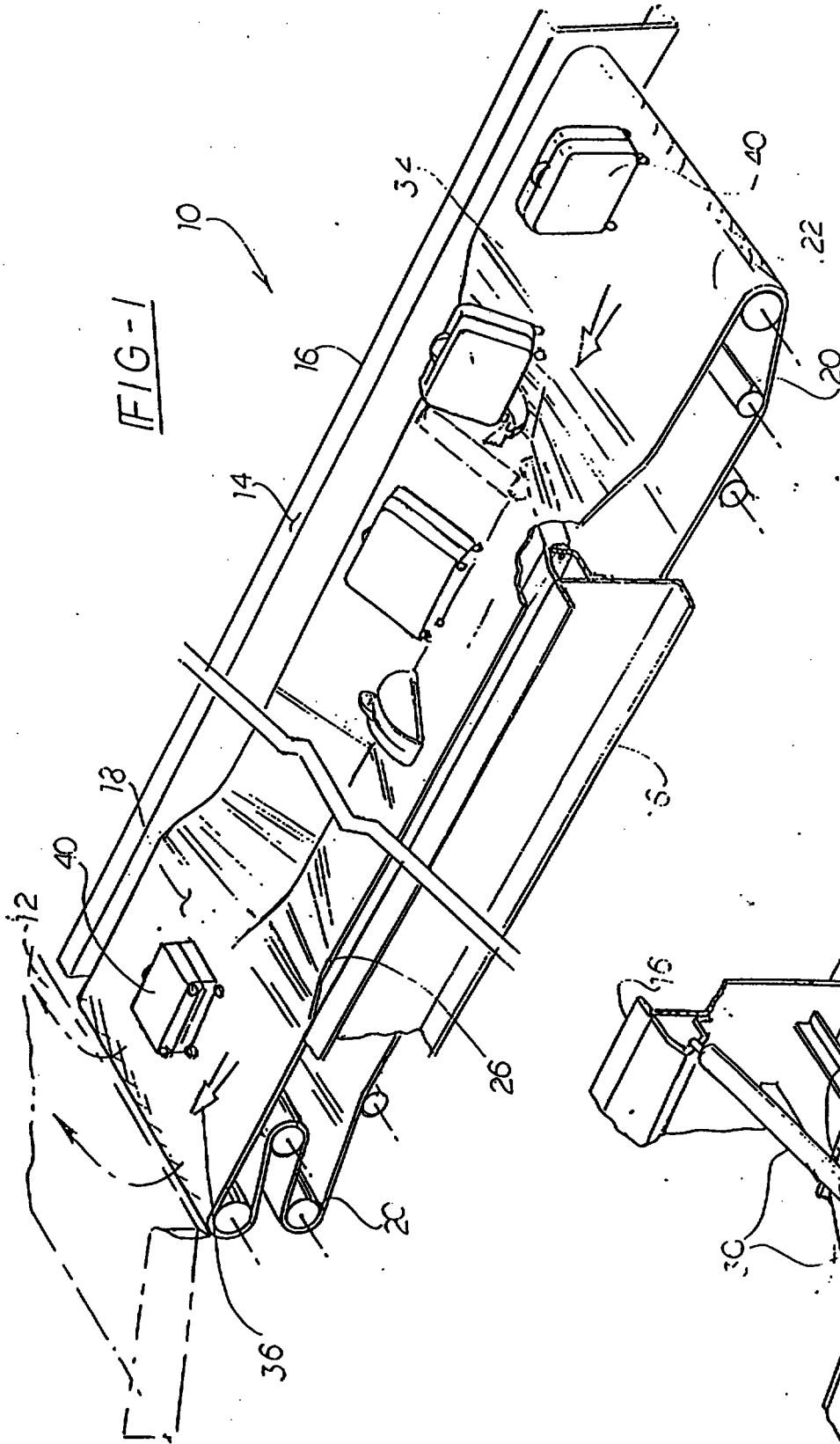


FIG-2

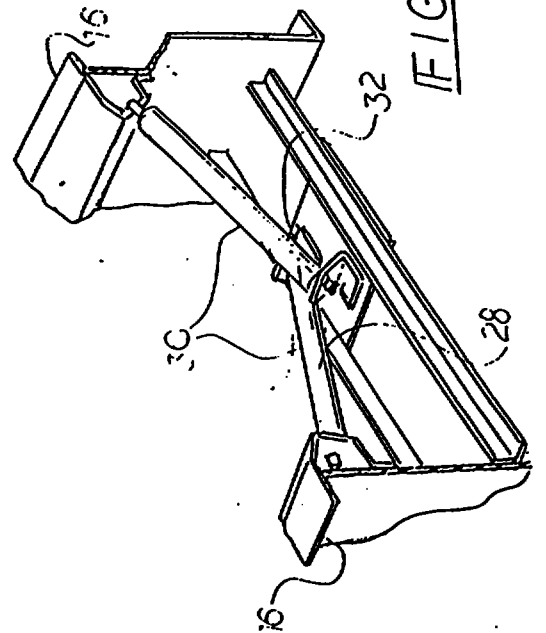




FIG-3

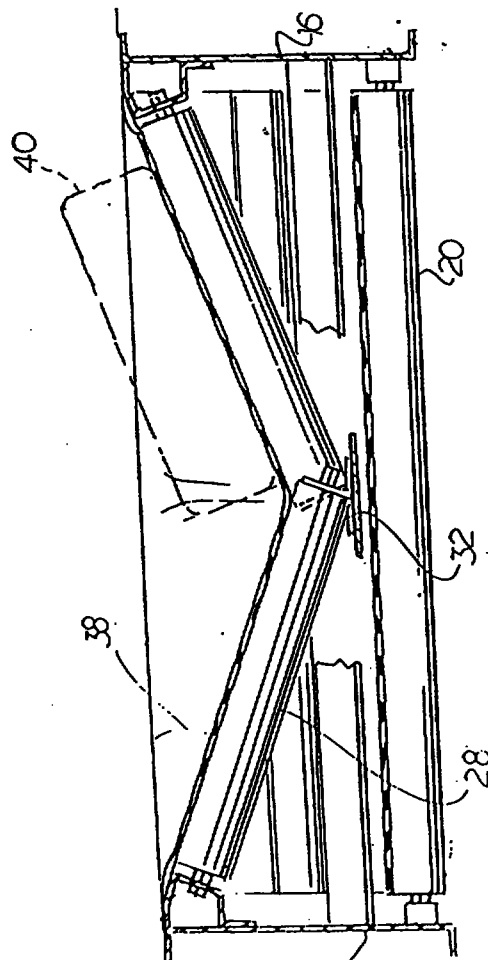
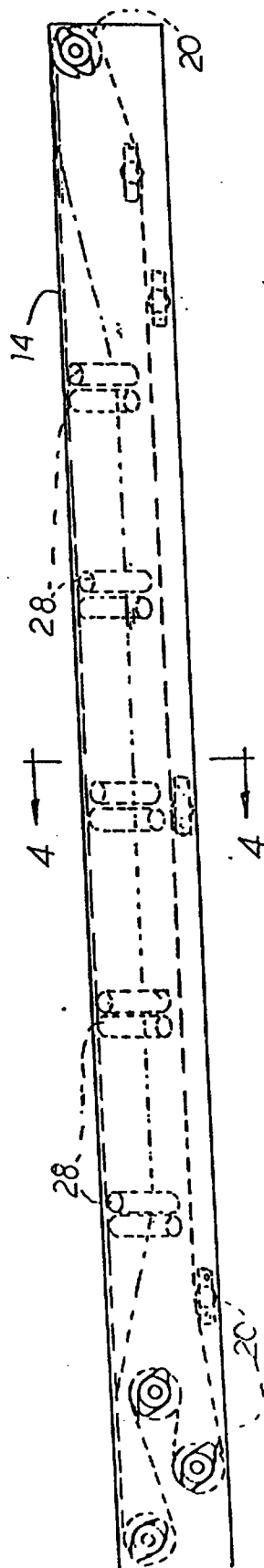


FIG-4

FIG. 3 is a side of a preferred embodiment of the present invention; and

FIG. 4 is a sectional view of the embodiment of Fig. 3.

5

**Detailed Description of a Preferred
Embodiment of the Present Invention**

With reference to FIG. 1, a conveyor 10 particularly suited for tipping an item 40, such as a piece of luggage, is thereshown. The conveyor system 10 includes a main frame 14 having a pair of longitudinally extending parallel spaced rails 16. The conveyor system 10 further includes a continuous belt 18 extending between the parallel spaced rail 16. A power driving assembly is provided within the main frame 14 for moving the belt 18 horizontally about the main frame 14. Although the system shown is particularly suited for luggage, the system may be used for any item which has a relatively high center of gravity in one alignment and a lower, more stable, center of gravity in a second alignment.

20 The power driving assembly (not shown) includes a motor (not shown) for driving a drive wheel 20. The drive wheel 20 frictionally engages belt 18 to move the belt about the main frame 14. The belt 18 is supported along a path of conveyance 48 by idler rollers 28 (shown in FIGS. 2-4) and drums. The drums rotate freely to guide belt 18 as it is being driven by drive wheel 20. A take-up assembly is provided opposite the drive wheel 20 along the conveyor path 48. The take-up assembly includes three drums each freely rotatable. The take-up assembly provides tension to belt 18. If the belt 18 becomes stretched through use and does not frictionally engage drive wheel 20a, take-up assembly drum is moved inwardly toward drive wheel 20 to tighten the slack in belt 18. The take-up assembly drum 52 may also be moved outward away from drive wheel 20 to increase the slack in belt 18, thereby increasing the frictional engagement of belt 18 along the idler rolls 28. Increasing the slack of



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belt 18 may be necessary to create the V-shaped profile desired to allow material 40 to fall into a prone position.

As shown in FIG. 1, the conveyor includes an in-feed conveyor section 22 extending from one end of the frame 14 for receiving an item 40. Preferably, the in-feed conveyor section 22 extends along a horizontal plane 34 parallel to spaced rail 16.

The conveyor also includes a discharge conveyor section 24 extending from an opposite end of the main frame 14 for delivering luggage 40 onto a main conveyor system 12 after the luggage has been tipped to a more stable configuration. The discharge conveyor section 24 also extends along a horizontal plane 36 parallel to the spaced rails 16.

An intermediate conveyor section 26 extends between the in-feed conveyor section 22 and the discharge conveyor section 24. As best shown in FIGS. 2 and 4, the intermediate conveyor section 26 operates to ensure the item 40 is transferred from the belt conveyor system 10 to the main conveyor system 12 in a prone position by providing a V-shaped section of the belt 18. The V-shaped section has two longitudinal portions which are angled at approximately 140° to each other. The longitudinal portions are supported on a series of troughing roller idler assemblies 28 as shown in FIG. 3.

With reference to FIGS. 2 and 4, each idler assembly includes a pair of idler rollers 30. One end of the roll is rotatably mounted in bracket 42 mounted to a side portion of the main frame 4 and an other end is mounted in a lower bracket 44 which is supported on a crosspiece 46 extending perpendicularly between the spaced rails 16. The rollers are mounted on an inclined axis 38 of approximately 20 degrees from the horizontal plane. For items such as luggage the 20 degree angle from horizontal ensures that the troughing roller idler assembly 28 will support the continuous belt 18 in a V-shaped contour 32.



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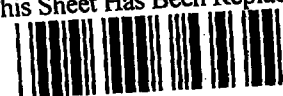
With reference to FIG. 1, the preferred embodiment of the conveyor 10 of the present invention is shown in use. The item 40, such as wheeled luggage, is set upon the conveyor 10 at the in-feed section 22. The wheeled luggage
5 40 has been set upon the conveyor 10 in an upright position or relatively unstable position.

As the item approaches the intermediate section 26 of the conveyor 10, the continuous belt 18 forms a V-shaped contour 32 defined by the troughing roller idler assemblies
10 28 due to gravity and the weight of the wheeled luggage 40. Luggage which is unstable because of a high center of gravity will fall to either side of the V of the belt and thus travel in a prone position to the discharge section 24.

As the luggage 40 approaches the discharge section
15 24 of the conveyor, the luggage 40 has a tendency to stay in the prone position as it enters the horizontal plane 36 defined by the discharge section 24. As such, luggage 40 is fed onto a main conveyor system 12 in a prone position.

Having described my invention, however, many
20 modifications, such as use of driven rollers rather than a belt to move the luggage through a V-shaped section, will become apparent to those skilled in the art. These and other changes are within the spirit of the invention as defined by the scope of the appended claims.

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CLAIMS

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1. A conveyor for transporting an item comprising;
a belt;
a frame having an intermediate section, said
5 intermediate section having a support structure for said
belt, said support structure forming a V-shaped trough in
said belt such that said item being transported on said belt
is tipped to a prone position; and
means for driving said belt about said frame.
- 10 2. The conveyor as defined in Claim 1, wherein said
support structure comprises at least one pair of idler
rollers mounted to said frame, each of at least one pair of
idler rollers angled with respect to each other to support
said belt in said V-shaped trough.
- 15 3. The conveyor as set forth in Claim 1, further
comprising an in-feed section disposed upstream from said
intermediate section, said belt being generally planar in
said in-feed section.
- 20 4. The conveyor as set forth in Claim 1, further
comprising a discharge section disposed downstream from said
intermediate section, said belt being generally planar in
said discharge section.
- 25 5. The conveyor as set forth in Claim 2, wherein said
frame has a longitudinal axis and each of said at least one
pair of rollers to said longitudinal axis is mounted at an
angle of 20 degrees to a horizontal plane extending through
said axis.
- 30 6. The conveyor as set forth in Claim 1, wherein said
frame further comprises a pair of spaced apart parallel
rails.



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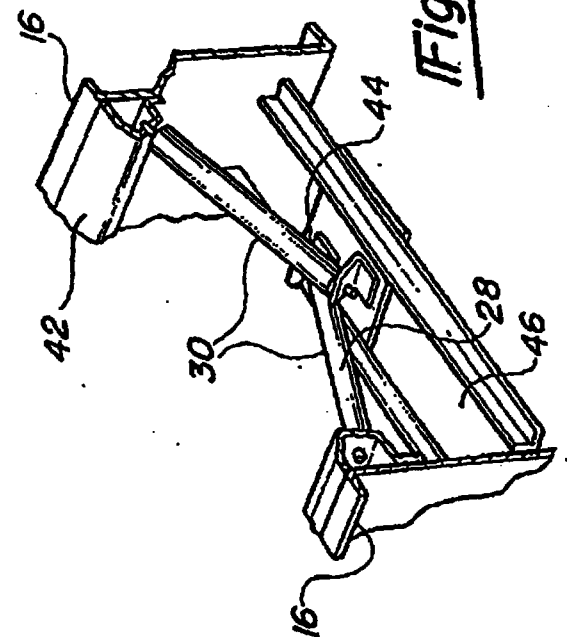
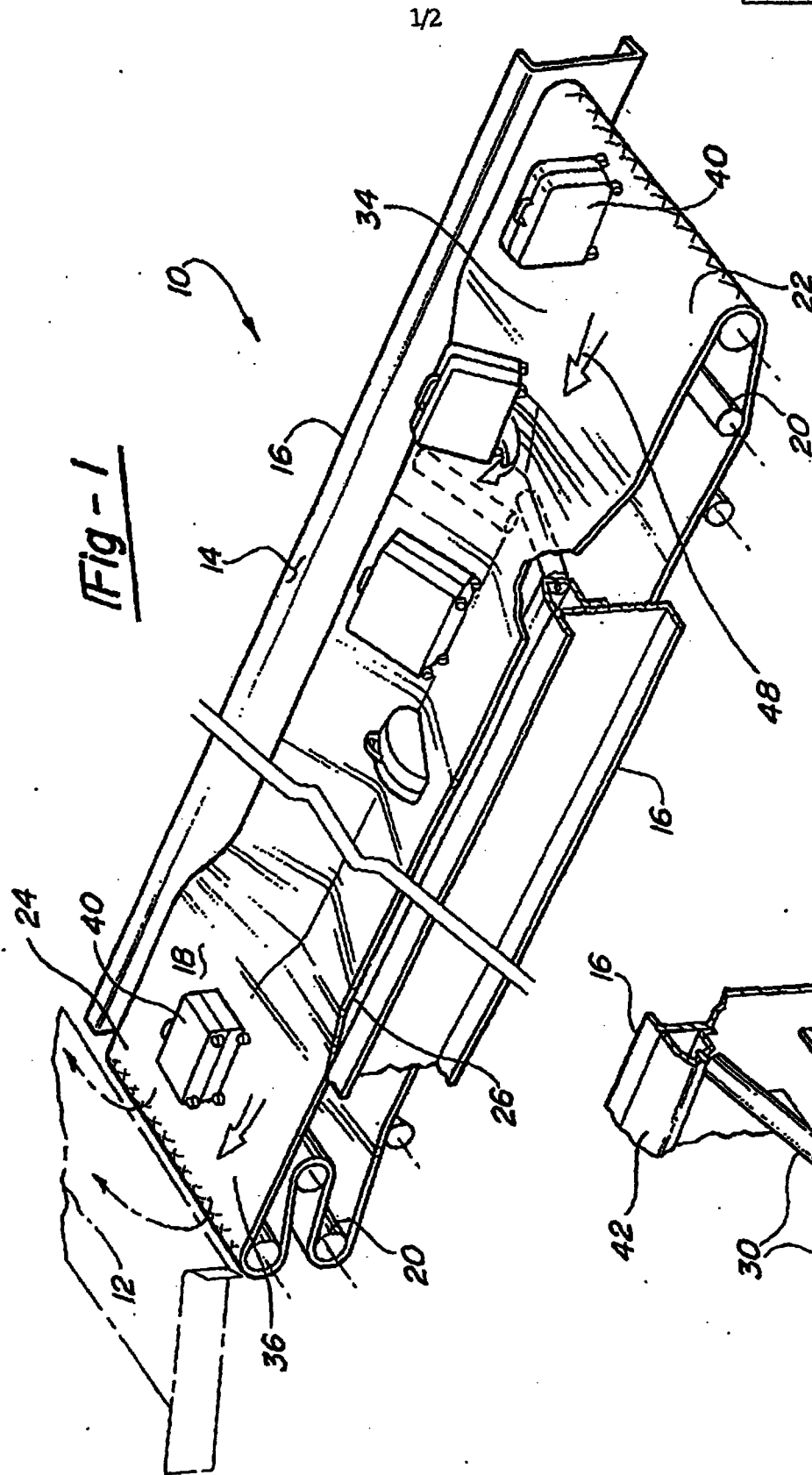


Fig - 3

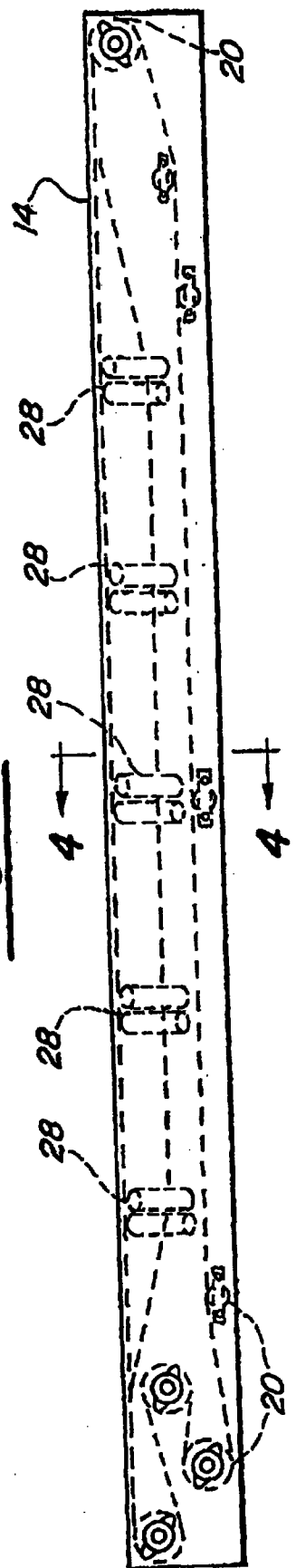
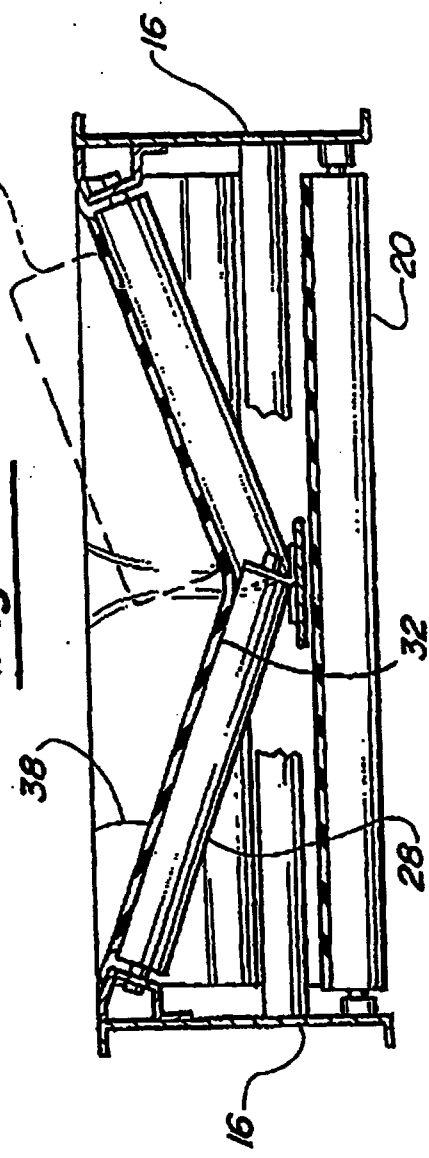


Fig - 4

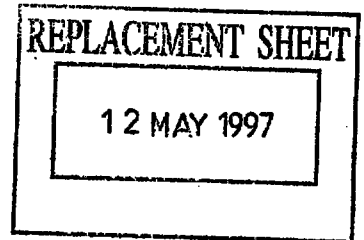


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CLAIMS

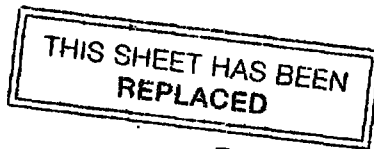


1. A conveyor for transporting an item comprising;
a belt;
a frame having an intermediate section, said intermediate section having a support structure for said belt, said support structure forming a V-shaped trough in said belt such that said item being transported on said belt is tipped to a prone position; and
means for driving said belt about said frame.
2. The conveyor as set forth in Claim 1, wherein said support structure comprises at least one pair of idler rollers mounted to said frame, each of at least one pair of idler rollers angled with respect to each other to support said belt in said V-shaped trough.
3. The conveyor as set forth in Claim 1, further comprising an in-feed section disposed upstream from said intermediate section, said belt being generally planar in said in-feed section.
4. The conveyor as set forth in Claim 1, further comprising a discharge section disposed downstream from said intermediate section, said belt being generally planar in said discharge section.
5. The conveyor as set forth in Claim 2, wherein said frame has a longitudinal axis and each of said at least one pair of rollers to said longitudinal axis is mounted at an angle of 20 degrees to a horizontal plane extending through said axis.
6. The conveyor as set forth in Claim 1, wherein said frame further comprises a pair of spaced apart parallel rails.

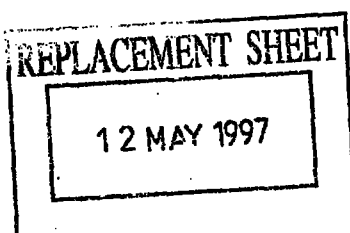


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7. The conveyor as set forth in Claim 2, wherein said at least one pair of rollers comprises a plurality of pairs of rollers.

8. The conveyor as set forth in Claim 1, wherein said belt is substantially inelastic.

9. The conveyor as set forth in Claim 1, wherein said driving means is a friction drive.

10. A method for delivering items in their prone orientation, comprising the steps of:

receiving items having any orientation; and

conveying said received items through a conveyor comprising

a belt;

a frame having an intermediate section, said intermediate section having a support structure for said belt, said support forming a V-shaped trough in said belt such that said items are tipped to a prone position; and

means for driving said belt about said frame.

11. The method as set forth in Claim 10, wherein said items are received at any position across the width of said conveyor.

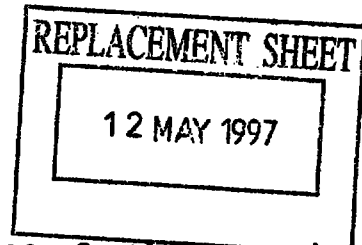
12. The method as set forth in Claim 11, wherein said items are delivered in their prone orientation and positioned along the centerline of said conveyor.

13. The method as set forth in Claim 10, wherein said items are luggage.

14. The method as set forth in claim 10, wherein said support structure comprises at least one pair of idler rollers mounted to said frame, each of at least one pair of idler rollers angled with respect to each other to support said belt in said V-shaped trough.



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15. The method as set forth in claim 10, further comprising an in-feed section disposed upstream from said intermediate section, said belt being generally planar in said in-feed section.

16. The method as set forth in claim 10, further comprising a discharge section disposed downstream from said intermediate section, said belt being generally planar in said discharge section.

17. The method as set forth in claim 14, wherein said frame has a longitudinal axis and each of said at least one pair of rollers to said longitudinal axis is mounted at an angle of 20 degrees to a horizontal plane extending through said axis.

18. The method as set forth in claim 10, wherein said frame further comprises a pair of spaced apart parallel rails.

19. The method as set forth in claim 14, wherein said at least one pair of rollers comprises a plurality of pairs of rollers.

20. The method as set forth in claim 10, wherein said belt is substantially inelastic.

21. The method as set forth in claim 10, wherein said driving means is a friction drive.



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WHEELED LUGGAGE TIPPER

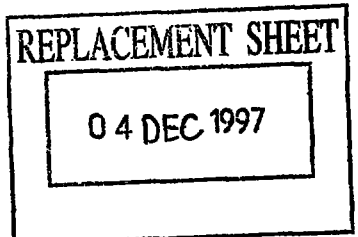
ABSTRACT OF THE DISCLOSURE

The invention relates to a conveyor that ensures the orientation of an item in a prone position when the item is fed onto a main conveyor. By ensuring the orientation of an item in a prone position, the invention can be used to transport luggage or equipment, such as wheeled luggage or golf bags, to an end distribution area. The conveyor provides for an in-feed section, an intermediate section and a discharge section of a conveyor. The in-feed and discharge sections both run parallel to the main support frame of the conveyor and provide a flat area to receive and discharge the material to be transported. The intermediate section extends between the receiving and delivery section and discharge section of the conveyor and has a V-shaped contour so as to tip the item being transported into a prone position.

FIGURE 1

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22. The conveyor as set forth in claim 2 wherein the rollers of said at least one pair of rollers are offset from one another in the direction of travel of said belt.

23. The conveyor as set forth in claim 1 wherein said V-shaped trough comprises a first set of rollers forming a first side of said trough and a second set of rollers forming a second side of said trough, and wherein at least some of said rollers in said first set of rollers are offset from said rollers in said second set of rollers in the direction of travel of said belt.

24. The conveyor of claim 1 wherein said frame includes first and second end sections on opposite ends of said intermediate section, and wherein said intermediate section is located at a lower elevation than the elevation of at least one of said end sections.

25. The conveyor for transporting an item in a direction comprising : a belt;

a frame for supporting said belt, said frame including first and second generally horizontal end portions for supporting said belt in a generally horizontal orientation and a trough portion located between said end portions and lower than at least one of said end portions; and,

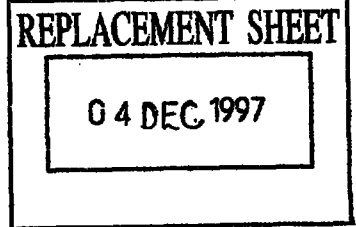
drive means for driving said belt along said frame.

26. A conveyor according to claim 25 wherein said frame comprises first and second generally parallel side supports and a parallel trough support located between and below said side supports, and wherein said trough portion comprises a first roller connected between said first side support and said trough support and a second roller connected between said second side support and said trough support.



27. A conveyor according to claim 26 wherein said first roller is connected to said trough support at a first location and said second roller is connected to said trough support at a second location, said first location being offset from said second location in said direction.





WHEELED LUGGAGE TIPPER

ABSTRACT OF THE DISCLOSURE

5 The invention relates to a conveyor that ensures the orientation of an item in a prone position when the item is fed onto a main conveyor. By ensuring the orientation of an item in a prone position, the invention can be used to transport luggage or equipment, such as wheeled luggage or golf bags, to an end distribution area. The conveyor provides for an in-feed section, an intermediate section and a discharge section of a conveyor. The in-feed and discharge sections both run parallel to the main support frame of the conveyor and provide a flat area to receive and discharge the material to be transported. The intermediate section extends between the receiving and delivery section and discharge section of the conveyor and has a V-shaped contour so as to tip the item being transported into a prone position.

10

FIGURE 1

position with a lower center of gravity. Such a conveyor is particularly useful in transporting luggage through airports.

The invention comprises a belt conveyor. The conveyor includes a frame having a frame supporting belt for transporting items such as luggage. The V-shaped intermediate section extends between a generally planar receiving and a generally planar discharge section of the conveyor. In the preferred embodiment, the intermediate section is at a different elevation than the generally planar receiving section. In the intermediate section, the items on the conveyor are carried at an angle because of the V-shaped trough. Items of luggage which are taller than wide are in an unstable position when supported from below at an angle. Accordingly, such items tip over to the prone or face-down position when travelling through the intermediate section. Pairs of idler rollers are mounted to the frame and angled with respect to each other so as to form the V-shaped trough. In the preferred embodiment, the rollers are offset from one another in the direction of travel of said belt so that articles of luggage travelling over the rollers will be rocked first in one direction and then in the opposite direction when travelling over these rollers. The change in elevation experienced by the luggage upon entering the intermediate section, together with the offset of the rollers, helps to destabilize the luggage and ensure that it tips into a prone position.

The item is then fed to a discharge section in a prone position and transferred onto the main conveyor system in this same position. By tipping the items into a prone position, the user is ensured that the material is discharged onto the main conveyor system in a stable prone position which eliminates misalignment or careening off the side of the conveyor of the items.

Other advantages and features of the present invention will become more apparent from the following detailed description when read in conjunction with the accompany drawings.

Brief Description of the Drawing

The present invention will be more fully understood by reference to the following detailed description of the preferred embodiments of the present invention when read in conjunction with the accompanying drawing, in which like reference characters refer to like parts throughout the view, and in which:

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FIG. 1 is plan view of the conveyor system of the present invention;

FIG. 2 is a fragmentary plan view showing the area of the conveyor system of the present invention that forces the orientation of material in a prone position onto a main conveyor system;

FIG. 3 is a side of a preferred embodiment of the present invention; and

FIG. 4 is a sectional view of the embodiment of Fig. 3.

Detailed Description of a Preferred
Embodiment of the Present Invention

With reference to FIG. 1, a conveyor 10 particularly suited for tipping an item 40, such as a piece of luggage, is thereshown. The conveyor system 10 includes a main frame 14 having a pair of longitudinally extending parallel spaced rails 16. The conveyor system 10 further includes a continuous belt 18 extending between the parallel spaced rail 16. A power driving assembly 1s provided within the main frame 14 for moving the belt 18 horizontally about the main frame 14. Although the system shown is particularly suited for luggage, the system may be used for any item which has a relatively high center of gravity in one alignment and a lower, more stable, center of gravity in a second alignment.

The power, driving assembly (not shown) includes a motor (not shown) for driving a drive wheel 20. The drive wheel 20 frictionally engages belt 18 to move the belt about the main frame 14. The belt 18 is supported along a path of conveyance 48 by idler rollers 28 (shown in FIGS. 2-4) and drums. The drums rotate freely to guide belt 18 as it is being driven by drive wheel 20. A take-up assembly is provided opposite the drive wheel 20 along the conveyor path 48. The take-up assembly includes three drums each freely rotatable. The take-up assembly provides tension to belt 18. If the belt 18 become stretched through use and does not frictionally engage drive wheel 20a, take-up assembly drum is moved inwardly toward drive wheel 20 to tighten the slack in belt 18. The take-up assembly drum 52 may also be moved outward away from drive wheel 20 to increase the slack in belt 18, thereby increasing the frictional engagement of belt 18 along the idler rolls 28. Increasing the slack of belt 18 may be necessary to create the V-shaped profile desired to allow material 40 to fall into a prone position.

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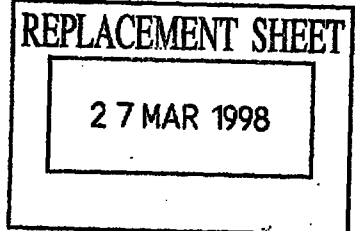
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As shown in FIG. 1, the conveyor includes an in-feed conveyor section 22 extending from one end of the frame 14 for receiving an item 40. Preferably, the in-feed conveyor section 22 extends along a horizontal plane 34 parallel to spaced rail 16.

The conveyor also includes a discharge conveyor section 24 extending from an opposite end of the main frame 14 for delivering luggage 40 onto a main conveyor system 12 after the luggage has been tipped to a more stable configuration. The discharge conveyor section 24 also extends along a horizontal plane 36 parallel to the spaced rails 16.

An intermediate conveyor section 26 extends between the in-feed conveyor section 22 and the discharge conveyor section 24 at a lower elevation than either infeed conveyor section 22 or discharge conveyor section 24. These changes in elevation help to destabilize articles of luggage as they pass from infeed conveyor section 22 onto intermediate section 26 and from intermediate section 26 onto discharge conveyor section 24. As best shown in Figs. 2 and 4, the intermediate conveyor section 26 operates to ensure the item 40 is transferred from the belt conveyor system 10 to the main conveyor system 12 in a prone position by providing a V-shaped section of the belt 18. The V-shaped section has two longitudinal portions which are angled at approximately 140° to each other. The longitudinal portions are supported on a series of troughing roller idler assemblies 28 as shown in Fig. 3.

With reference to Figs. 2 and 4, each idler assembly includes a pair of idler rollers 30. One end of the roll is rotatably mounted in bracket 42 mounted to a side portion of the main frame 14 and an other end is mounted in a lower bracket 44 which is supported on a crosspiece 46 extending perpendicularly between the spaced rails 16. As best seen in Figure 2, lower brackets 44 are offset from one another in the direction of travel of belt 18. The offset of the ends of roller 30 supported in these brackets 44 tends to rock articles of luggage passing over rollers pairs 30 first in one lateral direction and then in the opposite direction to help tip the article into a prone direction. The rollers are mounted on an inclined axis 38 of approximately 20 degrees from the horizontal plane. For items such as luggage the 20 degree angle from horizontal ensures that the troughing roller idler assembly 28 will support the continuous belt 18 in a V-shaped contour 32.



With reference to Fig. 1, the preferred embodiment of the conveyor 10 of the present invention is shown in use. The item 40, such as wheeled luggage, is set upon the conveyor 10 at the in-feed section 22. The wheeled luggage 40 has been set upon the conveyor 10 in an upright position or relatively unstable position.

As the item approaches the intermediate section 26 of the conveyor 10, the continuous belt 18 forms a V-shaped contour 32 defined by the troughing roller idler assemblies 28 due to gravity and the weight of the wheeled luggage 40. Luggage which is unstable because of a high center of gravity will fall to either side of the V of the belt and thus travel in a prone position to the discharge section 24.

As the luggage 40 approaches the discharge section 24 of the conveyor, the luggage 40 has a tendency to stay in the prone position as it enters the horizontal plane 36 defined by the discharge section 24. As such, luggage 40 is fed onto a main conveyor system 12 in a prone position.

Having described my invention, however, many modifications, such as use of driven rollers rather than a belt to move the luggage through a V-shaped section, will become apparent to those skilled in the art. These and other changes are within the spirit of the invention as defined by the scope of the appended claims.

CLAIMS

REPLACEMENT SHEET

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1. A conveyor for transporting an item comprising;
a single continuous belt;
a frame having an intermediate section, said intermediate section having a support structure for said belt, said support structure forming a V-shaped trough in said belt such that said item being transported on said belt is tipped to a prone position;
an in-feed section disposed upstream from said intermediate section at a different elevation than said intermediate section, said belt being generally planar in said in-feed section; and,
means for driving said belt about said frame.
2. The conveyor as set forth in Claim 1, wherein said support structure comprises at least one pair of idler rollers mounted to said frame, each of at least one pair of idler rollers angled with respect to each other to support said belt in said V-shaped trough.
3. The conveyor as set forth in Claim 1, further comprising a discharge section disposed downstream from said intermediate section, said belt being generally planar in said discharge section.
4. The conveyor as set forth in Claim 2, wherein said frame has a longitudinal axis and each of said at least one pair of rollers to said longitudinal axis is mounted at an angle of 20 degrees to a horizontal plane extending through said axis.
5. The conveyor as set forth in Claim 1, wherein said frame further comprises a pair of spaced apart parallel rails.
6. The conveyor as set forth in Claim 2, wherein said at least one pair of rollers comprises a plurality of pairs of rollers .
7. The conveyor as set forth in Claim 1, wherein said belt is substantially inelastic.



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8. The conveyor as set forth in Claim 1, wherein said driving means is a friction drive.

9. A method for delivering items in their prone orientation, comprising the steps of:

receiving items having any orientation; and
conveying said received items through a conveyor

comprising

a single continuous belt;

a frame having an intermediate section, said intermediate section having a support structure for said belt, said support structure forming a V-shaped trough in said belt such that said item being transported on said belt is tipped to a prone position;

an in-feed section disposed upstream from said intermediate section at a different elevation than said intermediate section, said belt being generally planar in said in-feed section; and

means for driving said belt about said frame.

10. The method as set forth in Claim 9, wherein said items are received at any position across the width of said conveyor.

11. The method as set forth in Claim 10, wherein said items are delivered in their prone orientation and positioned along the centerline of said conveyor.

12. The method as set forth in Claim 9, wherein said items are luggage.

13. The method as set forth in claim 9, wherein said support structure comprises at least one pair of idler rollers mounted to said frame, each of at least one pair of idler rollers angled with respect to each other to support said belt in said V-shaped trough.



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14. The method as set forth in claim 9, further comprising a discharge section disposed downstream from said intermediate section, said belt being generally planar in said discharge section.

15. The method as set forth in claim 13, wherein said frame has a longitudinal axis and each of said at least one pair of rollers to said longitudinal axis is mounted at an angle of 20 degrees to a horizontal plane extending through said axis.

16. The method as set forth in claim 9, wherein said frame further comprises a pair of spaced apart parallel rails.

17. The method as set forth in claim 13, wherein said at least one pair of rollers comprises a plurality of pairs of rollers.

18. The method as set forth in claim 9, wherein said belt is substantially inelastic.

19. The method as set forth in claim 9, wherein said driving means is a friction drive.

20. The conveyor as set forth in claim 2 wherein the rollers of said at least one pair of rollers are offset from one another in the direction of travel of said belt.

21. The conveyor as set forth in claim 1 wherein said V-shaped trough comprises a first set of rollers forming a first side of said trough and a second set of rollers forming a second side of said trough, and wherein at least some of said rollers in said first set of rollers are offset from said rollers in said second set of rollers in the direction of travel of said belt.



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22. The conveyor of claim 1 wherein said frame includes first and second end sections on opposite ends of said intermediate section, and wherein said intermediate section is located at a lower elevation than the elevation of at least one of said end sections.

23. The conveyer for transporting an item in a direction comprising :

a belt;

a frame for supporting said belt in a generally V-shaped configuration, said frame including first and second generally horizontal end portions for supporting said belt in a generally horizontal orientation and a trough portion located between said end portions and lower than at least one of said end portions; and,

drive means for driving said belt along said frame.

24. A conveyor according to claim 23 wherein said frame comprises first and second generally parallel side supports and a parallel trough support located between and below said side supports, and wherein said trough portion comprises a first roller connected between said first side support and said trough support and a second roller connected between said second side support and said trough support.

25. A conveyor according to claim 24 wherein said first roller is connected to said trough support at a first location and said second roller is connected to said trough support at a second location, said first location being offset from said second location in said direction.

