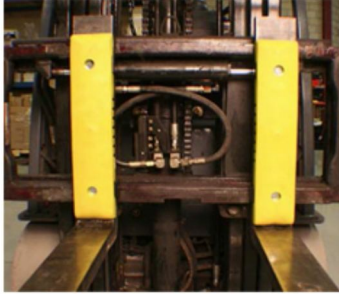


### Safe Bump Forklift Protectors

"Specifically designed for forklifts, these bumpers reduce damage in many applications. Safe-Bump attaches with two 100 lb magnets and (VHB) two way tape. The bumpers are made of soft PVC plastic that will absorb energy to prevent damage."

"Forklift Safety and Accesories." DBS: Driven to Safety. Dock Bumper Solution. Web 26 Mar. 2012 <[http://www.doksolutions.com/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)  
([http://www.doksolutions.com/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)) >



"Safe-Bump can be attached to the forks so they will prevent product damage like metal, wood, drywall, furniture, bottles, cans, appliances and electronics."

"Safe-Bump can also be used anywhere on the forklift body to absorb impacts. They attach to the truck with magnets and 3M VHB 2-way tape. The bumpers can easily bend 90 degrees so they can go around corners."

"Forklift Safety and Accesories." DBS: Driven to Safety. Dock Bumper Solution. Web 26 Mar. 2012 <[http://www.doksolutions.com/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)  
([http://www.doksolutions.com/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)) >

### Solution Analysis:

These bumpers, while effective at minimizing property damage by cushioning the impact between two hard objects, do not offer protection to people, who would still be crushed or run over by the forklift in the case of a tipover or a collision.

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"Forklift Safety and Accessories." DBS:  
Driven to Safety. Dock Bumper  
Solution. Web 26 Mar. 2012  
<[http://www.doksolutions.com](http://www.doksolutions.com/forklift_safety/index.html)  
[/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)

## Anti-Blind Spot Dome Mirror

([http://www.doksolutions.com/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)) >

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"Lift truck operators need to know what is going on all around the lift truck. This mirror gives a complete 180° view allowing the operator to give a quick safety check before they travel in reverse. Installs on any lift truck in seconds with 3M two sided tape."

"Forklift Safety and Accessories." DBS: Driven to Safety. Dock Bumper Solution. Web 26 Mar. 2012  
<[http://www.doksolutions.com/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html) ([http://www.doksolutions.com](http://www.doksolutions.com/forklift_safety/index.html)  
[/forklift\\_safety/index.html](http://www.doksolutions.com/forklift_safety/index.html)) >



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## Solution Analysis:

While effective at enhancing a forklift operator's field of vision and making it easier to look backwards, these mirrors do not come close to eliminating all rear blind spots.

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## Fork-Alert Warning System

"The Fork-Alert warning system is an electronic early warning system designed for use where forklifts, cranes and other moving equipment are used."

"The system monitors zones where these vital but inherently dangerous machines are being used, frequently reversing and with the operator's view obscured by its load, and alerts pedestrians that a moving machine is operating in their proximity."

"The system can be configured to trigger flashing lights and audio alarms when a forklift is operating in a controlled zone such as a blind corner or a pedestrian area. It utilises an infrared signal that can't travel through walls, minimising false alarms and potential confusion. The detection zone is adjustable to suit the desired coverage area in differing situations."

"Forklift Safety System." Safety Solutions.net.au. Westwick-Farrow Pty Ltd. Web 27 Mar. 2012 <[http://www.safetysolutions.net.au/products](http://www.safetysolutions.net.au/products/15890-Forklift-safety-system)  
[/15890-Forklift-safety-system](http://www.safetysolutions.net.au/products/15890-Forklift-safety-system) (<http://www.safetysolutions.net.au/products/15890-Forklift-safety-system>) >

## Solution Analysis:

Safety systems which rely on audio and visual alert signals have become all too common in warehouse environments. Such systems are largely disregarded by workers and pedestrians because these alerts are a commonplace occurrence.

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## Traction Control System

"Designed for installation on any forklift, Aftermarket Traction Control System prevents drive tires from free spinning when forklift operates on slick surface."

"Traction Control System solves forklift safety issue." ThomasNet.com News. Thomas Publishing Company. Web 27 Mar. 2012 <<http://news.thomasnet.com/fullstory/Traction-Control-System-solves-forklift-safety-issue-559303>> (<http://news.thomasnet.com/fullstory/Traction-Control-System-solves-forklift-safety-issue-559303>)>

### Solution Analysis:

While a system which prevents forklifts from losing stability because of loss of traction is useful, most forklift accidents involving a loss of stability occur without the involvement of any slick surface. As such, the demand for a viable solution to forklift loss of stability still exists.

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## Toyota SAS - System of Active Stability

### 1. The Swing Lock Cylinder

"On 4-wheel forklifts if the forklift becomes unstable during a turn, the rear axle will lock automatically. This helps to prevent side tip-over by adjusting the forklift truck's centre of gravity."

### 2. Speed reduction when cornering

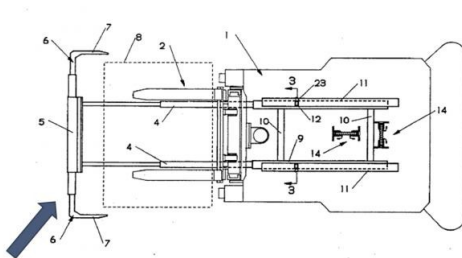
"On 3-wheel Toyota forklifts, if Toyota SAS judges the turning speed to be dangerously high, it will automatically slow the forklift truck down to maintain stability."

"Toyota SAS 6 Stability Functions." *Toyota Forklifts Europe*. Toyota Industrial, n.d. Web. 26 Apr. 2012. <<http://www.baltic.toyota-forklifts.eu/En/Products/innovations/sas/Pages/Toyota-SAS-stability-functions.aspx>> (<http://www.baltic.toyota-forklifts.eu/En/Products/innovations/sas/Pages/Toyota-SAS-stability-functions.aspx>)>

### Solution Analysis:

Only newer toyota forklifts implement the SAS System and the models that do are significantly more expensive than those which do not incorporate SAS.

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## Anti-Collision Safety Device

Acts as a bumper in front of the forklift to prevent property and/or vehicular damage in the event of a collision

"United States Patent #5213383"

<http://www.google.com/patents/US5213383?printsec=abstract#v=onepage&q&f=false> (<http://www.google.com/patents/US5213383?printsec=abstract#v=onepage&q&f=false>)

## Solution Analysis:

The Anti-Collision Safety Device does not in fact prevent collisions. Similar to the Safety Bumpers, it prevents damage to property and forklift in the occurrence of an accident. It does not limit the damage done to a person.

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## White Sound Alarm

Attached to a forklift, it emits a loud sound to alert pedestrians when a forklift is reversing.



"Forklift Safety in Warehouses," *ForkliftAction.com*. Forklift Action, n.d. Web. 26 Apr. 2012. <<http://forkliftaction.com/news/newsdisplay.aspx?nwid=5291>

(<http://forkliftaction.com/news/newsdisplay.aspx?nwid=5291>) >.

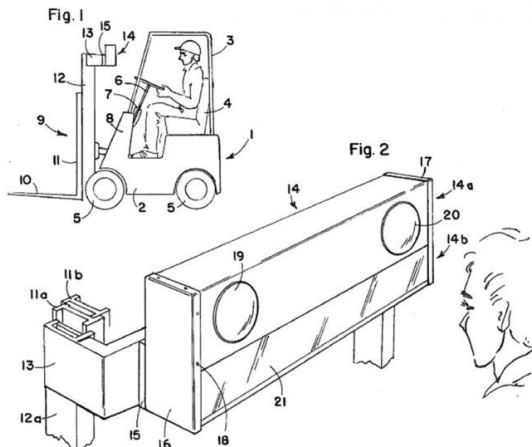
## Solution Analysis:

Similar to the Fork-Alert Warning System, safety systems which rely on audio and visual alert signals have become all too common in warehouse environments. Such systems are largely disregarded by workers and pedestrians because these alerts are a commonplace occurrence.

"Unfortunately, because of the monotone, regularly intervalled alarm noise becomes part of the background noise and people except the forklift operator don't actively hear it."

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U.S. Patent Mar. 13, 1984 Sheet 1 of 2 4,436,374



## Forklift Safety Scope

Provides increased visibility to the forklift operator. The operator can see behind him or her without having to turn his or her head around. This allows the operator to maintain visibility in front of the forklift while still being able to look backwards.

"United States Patent #4436374"

<http://www.google.com/patents/US4436374?printsec=abstract&dq=forklift+safety+scope&ei=RxxfUOj2CqH20gH6q4CAAQ#v=onepage&q=forklift%20safety%20scope&f=false> (http://www.google.com/patents/US4436374?printsec=abstract&dq=forklift+safety+scope&ei=RxxfUOj2CqH20gH6q4CAAQ#v=onepage&q=forklift%20safety%20scope&f=false)

## Solution Analysis:

The Safety Scope does not eliminate any rear blind spots, it just allows the operator to view backwards more easily.

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Picture Source: "To AGV or Not to AGV." *ForkliftAction.com*. Forklift Action, n.d. Web. 26 Apr. 2012. <<http://www.forkliftaction.com>

[/news/newsdisplay.aspx?nwid=10054](http://www.forkliftaction.com/news/newsdisplay.aspx?nwid=10054)>.

### Solution Analysis:

AGVs are not applicable in all warehouse scenarios.

"Those in manufacturing can see their potential in cutting costs and improving efficiencies but think them overly complicated and prohibitively expensive except in large-scale use, while those in distribution see them as unable to meet rapidly changing warehouse needs."

"To AGV or Not to AGV." *ForkliftAction.com*. Forklift Action, n.d. Web. 26 Apr. 2012. <<http://www.forkliftaction.com/news/newsdisplay.aspx?nwid=10054>>.