WELCOME!
The Effects on Material Handling Equipment Design with an Aging or Obese Workforce
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There are no manual handling issues ....

NOT!
Current Worker Population

- In 1972, average age of a US worker was 28. Currently it is approximately 46.

- The number of workers aged 45 and older has doubled since 1950.

- According to the AARP, the number of people 55 years and older in the labor force – which stood at about 18.2 million in 2000 – is projected to rise to 25.2 million this year and 31.9 million by 2025.
As We Age…..

Maximal Strength
Muscle Mass
Bone density
Visual and Auditory Acuity
Fitness
Aerobic Capacity
Cognitive Speed/Function

Obesity
Diabetes
Arthritis
High Blood Pressure
Depression/Heart Disease
Menopausal/Post Menopausal Issues
Definitions of Obesity

Obesity: Body Mass Index (BMI) of 30 or higher.

(Mine’s 31.6 – Boo!)

Body Mass Index (BMI): A measure of an adult’s weight in relation to his or her height and age.
Percent of Obese (BMI $\geq 30$) in U.S. Adults

1990

No Data          <10%           10%–14%
Percent of Obese (BMI $\geq 30$) in U.S. Adults
Definitions of Obesity

- Obese is generally defined as at least 30 to 40 pounds overweight.
- Severely obese is considered to be at least 60 pounds overweight.
- Morbidly obese is at least 100 pounds overweight.
- Super obese is considered at least 200 pounds overweight.
Scope of the Problem

The most obese workers file twice as many Workers Compensation claims as healthy weight workers.

The most obese workers have 13 times more lost workdays than healthy weight workers.

Workers Compensation medical claims cost are 6.8 times higher for the most obese workers.
Indemnity costs are 11 times higher for most obese workers than healthy weight workers.

The body parts most prone to injury are: back, lower extremities, wrist, and hands.

The most common causes of these injuries were lifting, lowering and slipping directly associated to manual material handling.
Pallets

Approximately 475 million new pallets produced each year in the USA. 1.4 billion (est’m) pallets are in use at any given time.

MANUAL LOADING AND UNLOADING OF PALLETS CONTINUES TO BE ONE OF THE MOST COMMON AND MOST INJURY PRONE TASKS IN INDUSTRY TODAY
Here is a very typical problem
OOH! My aching back….

Also typical carrying heavy loads….

....then picking or placing those loads on pallets which are on the floor.
In this retail paint store 65 to 80 lb. pails need to be moved from pallet to mixer and shaker - then back to the pallet.
The solution not only solves the lower back problem, it substantially enhances productivity.

Positioners allow the worker to stand erect, dramatically reducing the back bending...reducing the walking is key.
New designs to both transport, lift and position heavy pails

2 wheel devices require the worker balance the load, not so with 4 wheel devices
Positioners hold pallet loads to a proper height
Traditionally positioners were “square”

Today they are round

Traditionally portability sets were added to the outside of the bases

Today they are tucked under
Positioner hold the top layer of goods in the ergonomic “magic Window” (30” to 40” from the floor)

As much as 40% of the time required loading a pallet, can be spent walking around it!
Positioners respond to the load  

Leaving the operator to concentrate on the task  

Bad idea.
Another solution to manually handling loads is the use powered stackers. They are highly maneuverable in tight quarters.
Inexpensive stackers to transport pallet loads in and around work stations

Notice the ergonomic handles.

Narrow masts for improved visibility.
Pallet rotators make quick work exchanging pallets...

...and they eliminate the human interface
With a lift table to level the stack the lumber can be feed in as fast as the machine can process it – no wasted motion here.
Manual loading and unloading of wire baskets, containers and Gaylord's leads to a high incidence of lower back injuries.
Back bending, reach over
…very fatiguing for the aged
or obese worker
Portable tilters also provide for getting to all the material in the container.
They can work like this....

....or like this.
High hinge tilters are ideal for gaining access to the bottom and back of containers.

Future designs have to minimize this reach over.
Picking 1,000’s of small parts made easy by using tilters

Notice the high hinge causing the container to elevate as it tilts
Here are good examples of how industrial tilters foster good ergonomics and help the older or obese worker get the job efficiently.

Future designs have to minimize this reach over.
Other considerations
Lift tables and gravity conveyor provide efficiency gains as well as ergonomic improvements.
Proper positioning maximizes production & minimizes ergonomic issues.

Positioning large assemblies:
- Turntable
- Lift Table

Notice the cut-out to get the worker in close to his work.
Lift & Tilt to position electrical panels in this work cell
Hydraulic tilt table for large window assembly and inspection
In this retail paint store 40 to 50 lb. cartons (4 gals.) need to be moved to shelving.

Balancing 250 lbs.
This lifting device permits a greater number of employees to get the same job done — a job previously assigned to people which had the upper body strength.

Battery powered scissors lift
Two wheel hand truck with powered lift
Ergonomic Guidelines for Manual Material Handling

Pick up your free copy
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