

Of course we can build a better wheelchair

Susan Farricielli had two grandparents, now deceased, whom she loved and who lived near her. She noted their different lifestyles.

"My grandfather, 'Pop' DeCaprio, was near 90 when he died," she said. "He was active to the end. He kept a garden. When he couldn't get a ride to some place he walked."

On the other hand, her grandmother, Christine Farricielli, was immobilized at St. Regis Health Center in New Haven.

"She was in a wheelchair and totally alert but had lost the ability to be mobile. She had a circulation problem that should have been treated 20 years earlier."

That was when the granddaughter acquired a dim view of the construction and operation of the average wheelchair. She decided to do something about it.

Susan Farricielli is a 38-year-old industrial designer who has won a \$25,000 Design Arts Award from the National Endowment for the Arts to work on a wheelchair design for the elderly. The completed project will benefit people of other ages confined to wheelchairs but the elderly are the most numerous users by far.

I interviewed Farricielli recently at her offices on North Main Street in Branford.

"What's the matter with wheelchairs now in use?" I asked.

"In my visits to my grandmother," she said, "I noticed that she and others had lost mobility in wheelchairs. It was difficult for them to get into one, even with assistance.

"Probably the worst offender to body posture is the popular hammock-style wheelchair with its sling seat which places pressure at the outside of the joint where there is minimal cushioning and no support under the ischial tuberosities (hips) where 80 percent of body weight is concentrated.

"The concave support causes the rib cage to collapse, further contributing to the development of scoliosis (lateral curvature of the spine) and ultimately affecting the respiratory system."



Al Sizer/For the Register

Industrial designer Susan Farricielli of Branford has won a \$25,000 Design Arts Award from the National Endowment for the Arts to work on wheelchair design.



ALVIN V. SIZER

SECOND ROUND

The industrial designer wondered:

"When elderly people who are restricted to a wheelchair are transferred to them in the morning and returned to their beds at night, why must they be subjected to a chair that offers little advantage other than being collapsible for storage and transportation? Availability and price (\$400 to \$1,000 for un-motorized, \$3,500 motorized) are surely a factor, too."

She came to this conclusion:

"It would be ideal to design a wheelchair that competes with the popular model in weight, price and utility and surpasses this design in ergonomics by re-examining the needs of the user." (Ergonomics is the study of problems of people in adjusting to their environments.)

These observations led to Farricielli's evaluation of wheelchairs, plans for an improved model and the grant from the National Endowment for the Arts. In the course of the evaluation she rented and sat in a wheelchair while planning — she called it a "rattrap" — and spent an afternoon talking to doctors at Gaylord Hospital.

In identifying wheelchair problems she has had the help of Ric Famiglietti, who at 30 is paralyzed from the waist down after a motor cycle accident and in a wheelchair. She met him at a gym and he ha

YOU CAN HELP

Anyone interested in donating a wheelchair Susan Farricielli can use and dismantle or anyone wanting to make suggestions on wheelchair design can contact her at 488-1758.

been "a great resource" to her.

She invites others to give her tips and advice.

She would like to introduce new mechanical functions to the wheelchair and break away from the existing design, which includes tubular steel, sling seat and back, cycle-spoke wheels and the conventional way of collapsing the chair.

Changes might include streamlining the frame, implementing composite materials to give the chair a softer look and feel, molding the wheels and including an integrated gear and crank. Also, devising a new way to collapse the chair with a new rigid seat and covering the entire seating with a washable slipcover.

She wants a wheelchair that is propelled, not by turning the wheels by hand, but by a pumping motion.

She is embarked on a one-year program that must be completed before she can approach a manufacturer.

Her project calls for making a 3-D foam/plastic mock-up of the seating configuration and refining it, refining mechanical details, finding sources for parts, exploring materials and methods of manufacturing, constructing a hard model, revisions, control and mechanical drawings, preparation for presentation of a prototype and documentation, including photo and video.

Farricielli thinks it's appropriate for her to be working on a new wheelchair in view of the Special Olympics in New Haven in July.

"My wheelchair will look different," she promises. "It's aimed at the elderly but will be for all. I'm doing something that will help people."

Al Sizer is the former associate editor of the Register. His column appears here each Sunday.