Product Concept
for
Tarsier Software Solutions'

Personal Alarm Clock

Contents

Executive Summary

Introduction
Tarsier Software Solutions develops product concepts and licenses them to larger companies. These companies are able to utilise their domain knowledge, sales, marketing and distribution infrastructure to successfully commercialise our ideas for both companies' mutual financial benefit.

Summary
Our concept for a Personal Alarm Clock is primarily for couples where one needs to wake much earlier than the other and does not want to disturb their partner's sleep.

Product Overview
Our design comprises a digital alarm clock mechanism combined with an ear-piece. The digital alarm clock is worn at a comfortable location on the body. The ear-piece, connected to the alarm clock mechanism, allows the alarm to be heard only by the wearer, preventing anyone sharing the room from being disturbed by the alarm signal.

The Personal Alarm Clock is for anyone who needs to wake up at an earlier time than the person they share the room with. It is primarily aimed at couples that have to wake up at different times. But there are many other situations, such as when siblings share a bedroom, or travellers sharing a dormitory at a hostel, where one person needs to be woken without disturbing others in the same room.

Distribution channels can be traditional sales outlets with significant market differentiation coming from the design's aim - that the wearer's partner will not be disturbed by the alarm.

The proposed design does not include features or specifications that will make the Personal Alarm Clock significantly more expensive than traditional alarm clocks.

The Personal Alarm Clock can be marketed at a premium to other designs because the purchaser is not only purchasing an alarm clock, but also the "gift of an undisturbed morning" to the wearer's partner. As no other design offers this feature, the Personal Alarm Clock can be marketed to existing alarm clock users to replace their current alarm clock.

Product Description

Introduction
Our concept of a Personal Alarm Clock is aimed at couples where one person needs to be woken at a time much earlier than their partner or any situation where a person needs to be woken and doesn't wish to disturb other people sleeping in the room, such as siblings sharing a bedroom, or travellers sharing a dormitory at a hostel.

The following product description is based on the tests described in the **Design Feasibility Testing** section of this proposal.

The design comprises of a main unit to which an ear-piece is attached. The main unit contains the same components used in a typical digital alarm clock, namely;
➢ LCD display,
➢ buttons to set the clock and alarm time, back light the display, silence and snooze the alarm,
➢ the required electronics and battery.

To this typical alarm clock, our design adds a low-profile clip to the back allowing the unit to be clipped to the wearer's night attire or to a thin elasticised and adjustable strap. Once the main unit has been clipped on, the user inserts the ear-piece into their ear.

Main Unit
The Personal Alarm Clock has the functionality of a typical digital alarm clock. The prototype used by Tarsier Software Solutions for concept testing (see section **Design Feasibility Testing**) was a CASIO® PQ-10D.

This provided nearly all the functionality required of the main unit, namely:
➢ an easy to operate snooze button,
➢ additional buttons to set the hour and minute; alarm and current time,
➢ switches to select 12 or 24 hour display; whether the alarm is on or off,
➢ all controls, other than the snooze button, are protected from accidental activation by a flip cover, which can be folded back to form a stand,
➢ LCD display.

The Personal Alarm Clock would need to incorporate the following design changes,

➢ rather than switching the alarm off using a switch, the alarm should be turned off by double pressing the snooze button. (To turn alarm off the CASIO® PQ-10D used as the prototype, the cover must be pulled down to access the switch. This is not a hindrance as the cover is flipped back to form a stand),

➢ the ability of the main unit to emit an alarm signal if the alarm is not turned off or snoozed after a pre-set amount of time. This acts as an "emergency back-up" in case the ear-piece fell out during the night,

➢ the need for a volume control (possibly). (Volume control could be implemented either by a volume control switch, or by making the alarm signal become progressively louder the longer it sounds),

➢ the button and switch cover does not need to flip back to form a stand, as it would be used to cover the settings switches and buttons to prevent accidental activation.

Ear-Piece

Following our tests with our prototype (see section **Design Feasibility Testing**), the design is based on a "sound-pipe" and an ear-piece from a behind-the-ear hearing aid. This type of ear-piece uses a flexible piece of plastic that when inserted into the ear, expands to hold the unit in the ear. The ear-piece connects to the sound source via a soft plastic "sound-pipe".

To improve comfort, the ear-piece should incorporate a clip that wraps round the back of the ear and holds the ear-piece in place over the ear, rather than relying on inserting the ear-piece into the ear to hold it in place.

This design requires a miniature piezoelectric sounder to provide the alarm signal. The sounder is incorporated into the main unit of the alarm clock. As the tube is very light and flexible it should not disturb the wearer.

As the alarm signal is directed into the wearer's ear, the volume of the alarm signal can be lower then conventional alarm clock designs, allowing a smaller sounder to be used. The additional space can be used for sound insulation of the sounder. The lower volume required and the incorporation of sound insulation will reduce the possibility of waking others in the room.

Design Feasibility Testing

Prototype Description
A basic prototype of the proposed Personal Alarm Clock was developed to prove the feasibility of the design.

As Tarsier Software Solutions is primarily a software development company, we do not have the facilities to create a complete prototype of the Personal Alarm Clock. However, we developed a basic prototype from components with the required functionality and appropriate dimensions.

The prototype was made from a:
➢ CASIO® PQ-10D alarm clock,
➢ "sound-pipe" and ear-piece from a behind-the-ear hearing aid.

It was not possible for us to connect the ear-piece to the alarm clock, i.e. for the alarm signal to be heard in the ear-piece. However the purpose of the test was not to determine whether the ear-piece can be used to hear the alarm signal, rather whether it was possible to wear the ear-piece comfortably and that it will stay in-place at night.

Prototype Performance Objectives
The prototype was developed to confirm the following requirements of the design;
1. that the main unit can be worn without disturbing the wearer's sleep,
2. that the ear-piece can be worn without disturbing the wearer's sleep,
3. that the ear-piece can be worn while the wearer is asleep, without falling out of the wearer's ear.

These requirements were the focus of our performance testing as they have not been implemented in other alarm clocks.

Prototype Performance Results
Objective 1
It was verified that the main unit can be clipped on to garments on the wearer's upper torso and a connection to the ear-piece will not disturb the wearer.

Objective 2
The first trial used an ear-piece from a personal stereo, but it was found that this can not be worn for long periods, or in the ear that is being laid on when the wearer is sleeping on their side, without discomfort.

A sound-pipe and ear-piece from a behind-the-ear hearing aid was then tested. It was found that it was comfortable to go to sleep wearing the ear-piece and it was not painful when the ear was slept on.

However, the ear-piece did irate the ear after some hours of sleep. The design of the ear-piece should be modified. Our proposal is to include a clip that wraps round the back of the ear, which holds the ear-piece in place over the ear hole, rather than relying on inserting the ear-piece into the ear to hold it in place.

Objective 3
The ear-piece from a behind-the-ear hearing aid did not fall out during the night. However, the ear-piece was not worn for an entire night due to the irritation it caused. The proposed modification to the prototype ear-piece to incorporate a clip that goes around the ear and holds the ear-piece in place will increase the security of the ear-piece.

Marketing Plan

Markets
The Personal Alarm Clock will primarily compete in the present alarm clock market.

Positioning
The Personal Alarm Clock can be positioned not only as an alarm clock but also as a sign of caring for the wearer's night-time companion.

It can be positioned not only as a direct competitor to a normal alarm clock but also as a necessary replacement for anyone who cares for the person(s) sharing their room. The Personal Alarm Clock becomes a gift not only to its owner, but to those he/she loves.

This symbolism will allow the clock to be marketed at an increased margin over other alarm clocks which are primarily sold on price; an alarm clock's main function is to wake its user up, all other features are of secondary importance, except in the case of the Personal Alarm Clock.

Competitive Analysis
We have not been able to identify an alarm clock with the features and market segment of our design in shops or the Internet.

Based on our efforts to develop a prototype, we do not expect that the design and manufacturing costs of our design will significantly raise the cost price of the alarm clock, and certainly not by as much as the increase in the sale price that the market positioning of the clock will allow.

The following table lists the **retail** prices of the items purchased by Tarsier Software Solutions to develop our prototype.

Item	Purchase Price (S$)	US$ Equivalent
CASIO® PQ-10D	19.90	11.43
Behind the Ear hearing aid sound-pipe and ear piece	2.00	1.14
Total	**21.90**	**12.57**

Notes:
1. Singapore Dollar to United States Dollar exchange rate = 1.74 (weekly average for February 2001),

The overhead costs for our design will not be significantly different from that of the CASIO PQ-10D purchased. The cost of the items purchased to verify the possibility of wearing an ear-piece while sleeping, indicate that adding an ear-piece will not have a significant cost impact.

Licensing

If you're interested in licensing this Product Concept, please e-mail us at tarsiersoft@tarsiersoft.com referring to our **Personal Alarm Clock** product concept, reference **PC01-002**, for details of our standard Licensing Agreement.